

UXO Risk Assessment – Where are we 6 years on from the Publication of CIRIA’s UXO Guidance?

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Abstract

Increasingly, developers are seeking a second opinion on Unexploded Ordnance (UXO) risk assessments due to the apparent disparity between the evidence presented in the reports and the often extensive risk mitigation recommended. It is encouraging that so many developers are challenging the conclusions and recommendations made by some UXO specialists, which on the surface seem only to be dedicated to increasing their sales.

The potential risk of uncovering UXO is a key consideration for anyone developing a site in the UK. Significant areas of the UK remain contaminated with UXO arising from a variety of sources including military training, wartime bombing and munitions manufacturing or storage.

It is therefore essential for any developer planning to undertake intrusive works to obtain an objective, thorough and pragmatic risk assessment to ensure that appropriate risk mitigation measures are put in place based on a good understanding of the potential UXO hazard. This ensures both a safer environment for development and the potential for lower development costs by reducing the prospect of unexpected delays.

In July 2009, CIRIA published a guidance document, after extensive discussion with UXO specialists and other stakeholders, entitled “Unexploded Ordnance (UXO) A guide for the construction industry (C681)”.

The aim of the document is “...to provide the UK construction industry with a set and defined process for the management of risks associated with UXO from WWI and WWII aerial bombardment. It is also broadly applicable to the risks from other forms of UXO that might be encountered. It focuses on the needs of the construction professional if there is a suspected UXO on site and covers issues such as what to expect from a UXO specialist.”

There is no direct regulation of the UXO industry in the UK so developers are heavily reliant on the expertise of a small group of UXO specialists to provide professional advice. It is imperative that such advice relies on the primary goal of understanding any UXO hazard through an objective, thorough and pragmatic risk assessment, based on facts derived from detailed research.

This paper holds a mirror up to the UXO industry and evaluates how some specialists are failing to commit to the intention and essential principles of the CIRIA guidance, and offers developers an insight into some of the most important considerations when addressing the UXO risk on a site.

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Introduction

Given the UK's recent military history, including being bombed during two World Wars, one consideration any developer must take into account when developing a site is the potential for Unexploded Ordnance (UXO) to be present. This requires the developer to take all reasonable steps to ensure the safety of site workers and end users, the cost for which needs to be balanced with the commercial realities of developing a site. As such, the importance of a detailed risk assessment to accurately define the potential for a UXO hazard to be present on a site is paramount.

UXO risk assessments should be characterised by thorough research and considered interpretation to ensure that fair and reasonable conclusions and recommendations are made.

For years developers have had to rely on varying advice from a handful of UXO specialists typified by an apparent agenda to use the emotive issue of UXO to generate further business no matter what facts are presented.

Developers and other project stakeholders looked to the UK's Construction Industry Research and Information Association (CIRIA) to bring together experts from the UXO industry to listen to their concerns, with an aim to develop guidance for the management of UXO hazards within construction.

In 2009 CIRIA published guidance entitled "Unexploded Ordnance (UXO) A guide for the construction industry (C681)". In the absence of any formal direct regulation of the UXO industry in construction, the CIRIA guidance provides an excellent foundation on which to provide a consistent and professional approach to addressing a potential UXO hazard on a site.

Adopting its recommended approach, a UXO specialist should be able to provide a confident assessment of the likely UXO hazard level and provide a robust and pragmatic risk assessment based on thorough research, removing the requirement to err on the side of caution.

Unfortunately, such an approach is rare in the industry. Some assessments are seemingly more concerned with recommending extensive follow-on work than properly assessing whether a UXO hazard is likely to be present, therefore failing to provide a fair reflection of the potential UXO risk on a site.

Whilst paying lip service to CIRIA guidance, several UXO specialists in reality ignore best practice and muddy the waters of the risk assessment process so that developers are often confused about the best course of risk mitigation to take.

This is not only detrimental to the developer but to the UXO industry as a whole, with some UXO specialists apparently willing to exploit their reputations as 'experts' as a means of generating income.

Developers may soon tire of risk assessments, potentially leading to a 'cry wolf' situation where the risks are ignored to get their projects delivered, potentially leading to disaster.

A well-executed risk assessment can help to formulate investigation work, targeting specific areas of potential UXO hazard, culminating in a cost effective and focused investigation, with little adverse effect on the feasibility of the development.

A poorly-executed risk assessment can mislead and guide a client to over-expenditure, create an unsafe site environment due to an inadequate understanding of the real UXO hazard, and put the commercial feasibility of the development at risk.

This paper analyses the commercial value of thorough risk assessments as advocated by the CIRIA guidance, citing examples from recent projects to demonstrate where good industry practice could have prevented the wildly divergent and unhelpful conclusions and advice that are more commonly offered.

Preliminary Risk Assessments

The premise of a preliminary UXO risk assessment is straightforward. As detailed in the CIRIA guidance, just one question needs to be answered:

‘Has the preliminary risk assessment identified a requirement for a detailed risk assessment to be undertaken?’

This is a simple question and requires a simple answer of yes or no? The original intention of the CIRIA guidance was that a non-UXO specialist could typically answer this question based on freely available sources of information such as UXB risk maps offered online and a simple ‘Google search’ for the military history of a region.

By reviewing these records anyone should be able to provide a brief summary report detailing whether a source of UXO hazard may be present on a site and consequently whether further detailed research is necessary.

In the event that it is unclear, or a site is in a remote area with few easily accessible records, then the advice of a UXO specialist can be sought.

A preliminary assessment, whilst by its nature limited in scope, should be as objective as a detailed assessment. If the readily available records give no indication that a source of UXO hazard may be present on a site, then this should be clearly stated.

There is no requirement at the preliminary stage to provide a risk level or risk rating for the site. To do so may encourage the developer to bypass the detailed assessment stage and proceed straight to risk mitigation, which may be both unnecessary and create an unsafe environment where the UXO hazard is not properly understood. Providing numerical ratings and associated coloured risk diagrams based on sparse information during preliminary risk assessments is currently widely practiced throughout the industry and again only encourages unnecessarily extensive risk mitigation.

There are examples where a UXO specialist has advocated undertaking risk mitigation on the basis of their findings in a preliminary assessment. Indeed, one case advocated undertaking risk mitigation measures purely on the basis that there were sufficient records in the public domain indicating that WWII bombing had occurred around a site. A detailed risk assessment was carried out by another UXO specialist, which confirmed that the site had never been bombed and that there were no other obvious sources of UXO hazard present.

Despite stating to the contrary, this and many other preliminary assessments are not undertaken in compliance with CIRIA guidance and effectively dismiss the importance of conducting more detailed research to establish the real potential for a UXO hazard to affect a site. Just as important is understanding the type of ordnance that might be present, otherwise any risk mitigation measures may be addressing the wrong type of hazard and invoke safety concerns.

Any specialist in any field should strive for objectivity. Manipulating or giving misleading conclusions can have severe implications for the developer who is often obliged to follow a specialist’s advice given their presumed ‘expert’ status. This is particularly relevant in the UXO industry, where the emotive connotations surrounding UXO and the potential dangers they entail are often used to coerce developers into undertaking unnecessary and extensive works, apparently boosting the revenues of the more unscrupulous UXO specialists.

There have been instances where UXO specialists have recommended a detailed risk assessment simply because of the existence of a military establishment in the local area. Whilst offering no positive evidence that a source of UXO may exist on a site, it is often the

case that a UXO specialist will use extensive lists of military facilities 'in proximity' to the site to give a heightened impression of the potential UXO risk and therefore recommend further detailed research.

Whether intentional or not, some reports seem to suggest that the undertaking of a detailed UXO risk assessment increases the likelihood of UXO in the surrounding area. Such reports record the number of assessments undertaken in the region as a source of UXO.

Best practice would be to use the information in such previous studies (i.e. whether an elevated UXO hazard is present) to better define the UXO hazard on the site in question.

Any risk assessment, whether at the preliminary or detailed stage, should be site-focused. Using the dubious premise cited above, almost every site in the country would require more detailed assessment. Perhaps this is the intention of some UXO specialists in the UK?

A UXO specialist should endeavour to provide the necessary objectivity and doing so will lead to a good proportion of preliminary assessments concluding that no further research is warranted. This gives the developer reassurance that when a source of UXO hazard is identified on a site, the potential risk is not being overstated.

For some UXO specialists, the preliminary risk assessment is simply a means to an end. By building up an unrealistic impression about the potential for a source of UXO to be present on a site, they open up the opportunity for follow-on work which, as the following section demonstrates, is often characterised by a similar lack of objectivity.

Detailed Risk Assessments

Sources

A key stage of any detailed UXO risk assessment is to collate as much detail for potential sources of UXO as far as is reasonably practicable, while maintaining commercial viability of the service. This places a requirement on the UXO specialist to look beyond readily available internet-based sources and in-house databases.

According to the CIRIA guidance these sources should include, at a minimum:-

- Newspapers
- Local authority records
- Local library
- Local knowledge/stories
- Department of Communities & Local Government
- Local authority bomb maps/records
- The National Archives
- Historical texts
- Any publicly available MoD tri-service UXO records
- Specific bomb damage records and maps
- Crashed aircraft records
- Aerial photographs

Compliance with the above list cannot be based on a past archive visit that acquired general information such as statistics on regional bombing. The CIRIA guidance advocates gaining detailed site-specific records that are sourced as a standard part of the detailed risk assessment process. Through obtaining multiple historical records for a site, a sound analytical base is laid for the UXO risk assessment, allowing UXO specialists to make objective and reasoned conclusions through cross-examining and corroborating the various records at their disposal.

Unfortunately not all UXO specialists endeavour to attain information that is both site-specific and corroborative, consequently hampering their ability to exercise objectivity or provide satisfactory conclusions and commensurate risk mitigation recommendations.

The following section examines some of the key areas where professional practice falls short of the recommended CIRIA guidance.

Archival records

Archival information is paramount. We are fortunate that our predecessors left behind many detailed accounts of military sites and extensive WWI and WWII bombing records. These form an essential part of any risk assessment.

Probably the most common source of UXO hazard assessed is WWII bombing. Consequently, when assessing the UXO hazard, one of the most important tasks is to obtain site-specific bombing records from the local archives. This necessitates getting out of the office and visiting a local archive to gain specific information relating to the site. These sorts of records typically provide a far more comprehensive collation of air raid incident reports than those available online or at the National Archives. As a result, a UXO specialist can gain a more accurate impression of the level of bombing in the vicinity of a site. Without

these records, UXO specialists are reliant on regional statistics which often bear no relevance to the site in question.

An example of the level of detail that local bombing records can provide is given in Plate 1 below, covering a single incident in a rural area.

RIGHT RECEIPT	AUTHORITY		K	S	SL	DAMAGE
11/40 3-55	11/40 00-05	AT 22.20 HOURS 6/11/40 TWO H.E BOMBS WERE DROPPED AT [REDACTED] M/R 648762	N	I	L	SEVERAL W BROKEN
11-23	12-47	Ref 23-55. Reported H.E.'s were parachute mines. 1 exploded in ploughed field [REDACTED] 8/89 s.w. Parachute + container complete. Second mine exploded in field about 200 yds. from [REDACTED] Road, [REDACTED] M.R. 19/88 N.E. Parachute in pieces.				Slight damage church + school ceilings. Windows broken.
1-30	12-53	Bomb crater discovered, Timber Wood, Britton Court, M.R. 17/87 W. Time of falling probably night of 5K-6K/11/40.				NIL
13-00	23-14	At 21.30 hrs 1 H.E. near waterworks - KINGSTON				NIL Damage to water possibly railway.
13-55	00-05	AT 22.20 hrs. 2 H.E.'s [REDACTED] M.R. 89/19.				NIL Several w

Plate 1: Example of detailed local authority bombing records

In some cases in the industry, the value of archival research seems to have been neglected. Rather than undertaking such research as standard practice, some UXO specialists appear to rely on ageing databases and general regional statistics rather than engaging with site-specific data.

Relying on regional statistics alone is particularly problematic for large sites or routes which pass through several different local authority areas. It is essential that the records for each authority are gathered in order to get a proper overview of the level of bombing or military activity on such a site.

Some UXO specialists fail to do this meaning that they tend to provide 'blanket' risk assessments across large areas, instead of making an effort to zone the UXO hazard level, thereby failing to identify areas of greater or lesser concern.

Even in areas where the regional wartime bombing densities were very low, detailed records must be sought to discount the potential of a UXB being present. There have been numerous examples of UXO specialists concluding moderate and high risks on remote rural sites because of a lack of knowledge. Failure to obtain the appropriate records means that a risk assessment cannot positively conclude whether or not a site was bombed.

To corroborate detailed written records, or in the absence of any detailed written records, use of other sources (such as aerial photography) is critical in confirming whether bombs have fallen on a site. Making vague suppositions without the benefit of such information is poor practice.

An obvious advantage to the more unscrupulous UXO specialist - who does not attempt to gain site-specific records from the archives - is that they can turn around their risk

assessments in a matter of a few days. Whilst this might be commercially desirable in the short term, the long term implications for a developer on cost can be significant.

A major issue appears to be an overreliance on in-house databases, some of which contain information that is out of date or inaccurate. As such, these deficiencies in the database get repeated for a number of studies, indicating a lack of human input and quality control before issue.

Such an approach is always going to result in an over-exaggeration of the UXO risk on a site. For instance, if a UXO specialist does not possess the records to determine where and when bombs fell, they have to err on the side of caution and assume that a bomb may have fallen anywhere on a site.

The benefit of obtaining bombing records from local archives and record offices is perhaps most applicable when researching a site in London. With frequent development opportunities in the capital (which was of course heavily bombed during both WWI and WWII), pinpointing the precise locations of bomb impacts can have major implications for development costs.

From September 1940, the British government began to collate records of bomb damage and the location of bomb impacts as part of what became known as the 'Bomb Census'. In the past couple of years, the bomb census maps for London have been made available online. Whilst offering a potentially useful starting point for any UXO risk assessment, the accuracy and comprehensiveness of these bomb maps have seemingly not been understood by some UXO specialists. The bomb maps are apparently used as the 'complete' record of bombing, therefore negating the need for them to undertake more detailed research. In reality, the maps are both incomplete and, in some cases, inaccurate.

As the CIRIA guidance rightfully warns 'the detail and quality of information recorded in the Bomb Census for the early stages of the war is inconsistent...It is also possible that the figures were purposefully made inaccurate'.

A simple comparison can demonstrate this observation. The two extracts below are from the London bomb census map and a bomb map from a local authority archive. They show the same approximate area and yet there is a major discrepancy between what they depict. Whilst the bomb census map shows two recorded impacts on the area, the local authority map shows eight.



Figure 1: Comparison extracts of bomb census map and local authority bomb map

That the local authority map only covers raids up to January 1941 and the bomb census map purports to include all bomb falls up to July 1941 emphasises the latter's lack of completeness.

Interestingly, despite the reliance of some UXO specialists on the bomb census map as their sole source of information they still rarely conclude a low UXO hazard level. Given that the bomb census map seemingly underreports (unintentionally) the scale of bombing it would be logical that those relying on it would have more low risk sites. That they do not is perhaps a tacit acknowledgment that they know the map is incomplete and are therefore forced to err on the side of caution because of their dearth of records.

By obtaining corroborative bomb maps from local archives (such as the one above), Air Raid Precaution (ARP) records and aerial photography, a UXO specialist can be confident that the vast majority of bomb falls have been accounted for. Therefore, if there is no evidence that a site has been hit by a bomb, it is likely that this reflects reality and as such a conclusion of a low UXB hazard is logical.

Failing to obtain these detailed records can only be interpreted as poor practice that results in unnecessary risk mitigation works, benefitting no one except the UXO specialist.

Aerial photography

Since prior to WWII a number of organisations, including Aerofilms, the Royal Air Force (RAF) and the Ordnance Survey, have overflowed the UK providing an extensive archive of aerial photography that for a small fee can be acquired by UXO specialists. This has always been a particularly useful source when undertaking UXO risk assessments. Not only can such photographs highlight areas of bomb damage or cratering, they can identify the presence of temporary military installations or other facilities that would not be shown on historical maps due to their short existence or for reasons of national security.

Good practice for any UXO specialist is to select a range of suitable aerial photographs from those available to ensure good coverage of the site, a range of dates and scales. This

enables good corroboration between the written records retrieved from the archives and the evidence presented on aerial photographs.

Few UXO specialists appear to obtain aerial photography from outside providers. When they do, they appear to only acquire limited sets, not providing an optimum selection of dates, coverage or scales suitable for a risk assessment. Sometimes this may be due to a lack of availability but typically it is clear that further useful photographs that were available have not been obtained, perhaps in a bid to save money.

There is an overreliance amongst some UXO specialists on Google Earth's historical imagery. This resource has been misused for several years. Various parts of the country are covered by an historical layer on Google Earth, annotated as '1940' or '1945'. A UXO specialist obtaining a range of aerial photographs for a site will soon realise that these dates are indicative and not accurate.

This is not a criticism of Google, which makes no claims about the comprehensiveness of its historical imagery. Rather, it is a criticism of UXO specialists that clearly do not understand the nature of the source of information at hand, and make no attempt to verify records through corroboration from multiple sources.

Additionally, it is known that the Google Earth historical layer is often based on censored wartime aerial photography, which sometimes deliberately obscured important military sites. The two examples below prove this point.

Plate 2 shows two aerial images of an RAF station dating from 1945. On the left is the photograph from a specialist archive which clearly shows the airfield in use with a number of aircraft dotted around the perimeter track and on the landing ground.

On the right is the Google Earth 1945 aerial photograph of exactly the same location. It can be seen that the airfield has been deliberately erased and replaced by a series of fairly convincing field boundaries due to wartime censorship.



Plate 2: Comparison of sourced aerial photograph of an airfield and Google Earth image

Without recourse to other data, using the Google Earth image alone, one could be forgiven for thinking that an airfield never existed at this location. Additionally, even if the UXO specialist knows the imagery to be censored, they cannot use it to identify areas of potential bombing or munitions disposal which will impact upon their final risk assessment.

Likewise, switch on the '1945' layer for London on Google Earth and you will notice a number of strategic clouds which do not tend to conform to the regional weather pattern over the rest of the city.

As Plate 3 shows, these are used to obscure important military sites like Heavy Anti-Aircraft (HAA) gun batteries.

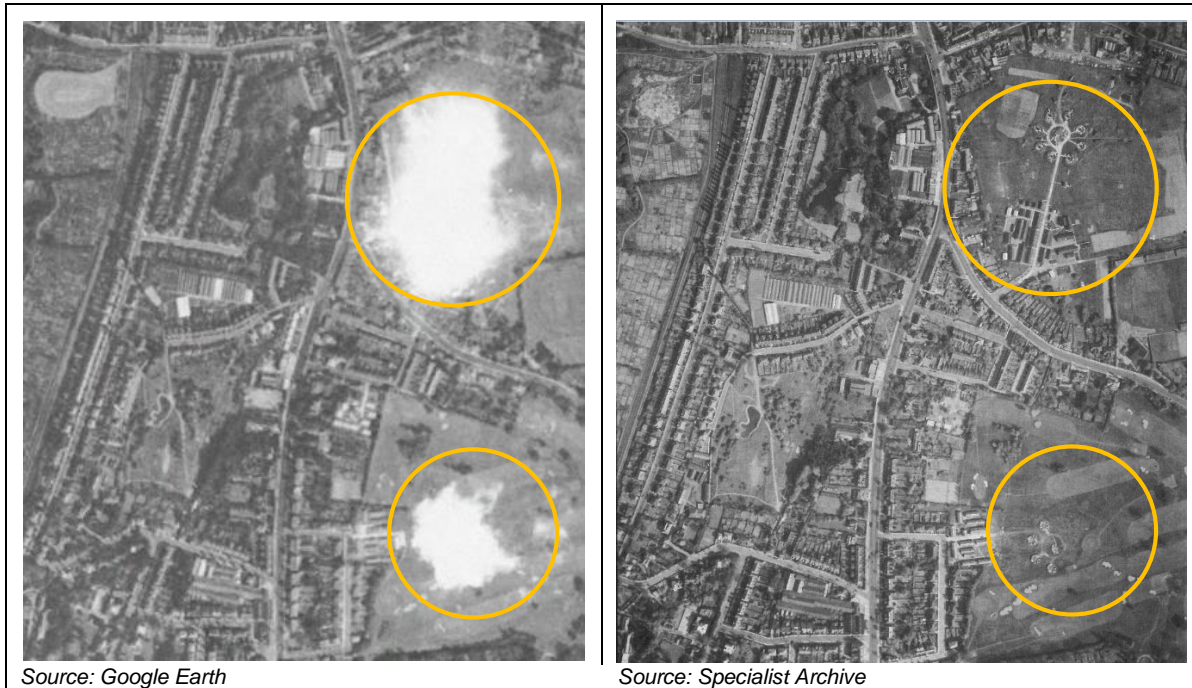


Plate 3: Comparison of censored and non-censored WWII aerial photographs

For risk assessments across linear sites (e.g. pipeline and cables routes), it is even more important to order aerial photography that covers the entire site, particularly those crossing large rural areas for which written records or accurate historical mapping may not be available.

As an example, a thorough UXO specialist collated aerial photography for a risk assessment of a proposed pipeline route that passed through a predominantly rural area. There was no evidence on historical maps or any other readily available sources that suggested the area had been used by the military.

Some of the WWII photography, however, showed a discreet set of earthworks on an area of parkland through which the route passed (see Plate 4 below). The nature of the earthworks (including some potential cratering) suggested that they had a military origin. Further research confirmed that the area had been requisitioned for training during WWII.

As such, the area was assigned a moderate UXO hazard level to reflect the elevated potential for encountering ordnance in this area as a result of military training and a suitable risk mitigation strategy was proposed. A subsequent UXO detection survey and investigation identified and removed several items of UXO, including WWII-era grenades and mortars.



Source: Specialist Archive

Not to Scale

Plate 4: Example of an unrecorded military training area in rural parkland

Without recourse to the aerial photography it is highly likely that this military training area would have been missed, potentially causing severe implications to the developer. At a minimum it would have entailed costs through delays to construction works and could have possibly caused harm to site workers.

Aerial photographs are undoubtedly valuable but are particularly effective as a corroborative tool against other records sourced through detailed research. Furthermore, without obtaining a range of aerial photography, a UXO specialist can only view a momentary snapshot of their site when formulating their risk assessment. Relying on free resources or other online sources with a limited range of photographs can lead to a less detailed understanding of military activities or wartime bombing.

Abandoned Bombs and UXBs – making factual reporting emotive

Abandoned bombs

Where there is good credible evidence for a bomb falling but not exploding (i.e. corroborative eye witnesses or visible entry holes) then it is classed as a UXB. Those that were left in place during WWII rather than being dealt with at the time by bomb disposal teams due to benign position, difficulty of access (such as in landfill sites, watercourses and graves) or lack of resources are classed as officially abandoned bombs.

At the end of WWII many of these bombs were either discredited or removed, whilst several others remained as being credible. Until recent years, the abandoned bomb register was

maintained and updated by the MoD. This is no longer the case. It is now held by the Department of Communities and Local Government (DCLG) and is no longer updated.

Determining the exact location and status of an abandoned bomb can be problematic but given the potential safety implications of one being present on a site, every effort must be made to clarify its position.

Rather than accepting outdated MoD reports or local authority records, a UXO specialist must make further enquiries to central government to confirm whether an abandoned bomb is present on a site. Older records such as those commonly found online may not have been updated and so it will often be the case that a previously recorded abandoned bomb has since been discredited or removed.

An example is that for a linear route UXO risk assessment. An old MoD report suggested that an abandoned bomb may have been present within the development boundary. Given that the proposed route could not be altered, the presence of the bomb would have major implications for construction works if its location was confirmed.

Rather than accepting the old MoD report at face value, the UXO specialist made further enquiries to obtain the most recent records held on the bomb in question. Ultimately, the information received (which included mapping of the suspected location) confirmed that the abandoned bomb was not on the site and therefore the risk assessment could be updated accordingly. This saved the developer significant costs, time and a potentially awkward public reassurance campaign.

A notorious contrast to this approach, cited in the CIRIA guidance, occurred when a UXO specialist undertook a risk assessment for a proposed tunnelling project and identified the presence of an abandoned bomb on the site. This led to a UXO detection survey being undertaken for the proposed tunnel route as part of the risk mitigation requirements. It was later revealed that this particular abandoned bomb had been discredited in the 1950s. The UXO specialist had relied on a local authority list from the end of WWII when conducting a risk assessment, rather than attaining the latest information from the official abandoned bomb register and the MoD. Over £100,000 was spent in conducting an ultimately needless UXO detection survey because of the failure to verify the validity of the sourced records.

Whilst verification of a bomb's location may result in a temporary delay to works, the potential savings that could result from a thorough consultation of the latest available records definitely makes the wait worthwhile.

UXO Detonation – Britain vs Europe

Since WWII, allied UXO has caused many fatalities in Europe as a result of accidental detonation, particularly during construction works. This is a function of the sensitivity of the types of UXO, exacerbated by the sheer number of UXO items left in the ground. Germany, in particular, was bombed twenty times more than the UK during WWII, and in France and Belgium, WWI trench warfare has left millions of items of UXO buried across thousands of acres of farmland.

In Britain there has not been a recorded fatality from the detonation of wartime UXB during construction for several decades. This is not to downplay the potential risk provided by UXO to the construction industry and its personnel, it is merely a fact. It also puts into context the reason why, unlike parts of Europe, the requirement to address the UXO hazard during construction is not directly covered by UK legislation.

The use of imagery to highlight the consequences of an accidental detonation must be both relevant to the likely hazard and not be used to put emotional pressure on the reader of the report. Such a technique can imply that the developer has a moral obligation to undertake some form of risk mitigation no matter what UXO hazard level is assessed for the site in question.

Referencing the numerous abandoned bombs in the surrounding area, highlighting the devastating impact of UXB detonation abroad, or making vague and suggestive statements about the potential for UXB to be present on a site, helps to paint a false impression of the UXO risk and ultimately can be used to justify unnecessary risk mitigation recommendations.

Verifying the facts

Whilst any UXO risk assessment should lead with the available records, there is always going to be a degree of interpretation about how certain sources are used when drawing conclusions. This is likely to vary from UXO specialist to UXO specialist. As the CIRIA guidance noted:

‘With no standard method of quantifying the risk from UXO there is considerable scope for variation in the interpretation of the findings and later recommendations for appropriate risk mitigation works’.

One of the key aims of the guidance was to create some uniformity across the industry so that the basic facts consulted were consistent for each assessment. From this, it was fairly reasoned, objective conclusions could be drawn.

Such a premise has been undermined, however, by the failure of the majority of UXO specialists to define their hazard/risk levels. The terms low, moderate and high consequently have no consistency across the industry and therefore risks assessments lack the uniformity advocated by the CIRIA guidance.

A lack of basic professionalism in some segments of the industry is usually to the detriment of the developer. There are numerous examples of UXO specialists failing to meet the recommendations of the available guidance and this is perhaps why the industry is often accused of inconsistency. A major flaw is the failure to present the available evidence in a coherent manner and to ensure that it is properly corroborated with other records.

For instance, it is common to see detailed risk assessments suggesting that a military site such as an airfield has a UXB hazard associated with it because it would have been a strategic target during WWII. Unfortunately, many assessments fail to undertake any research to confirm whether the military establishment was actually bombed and therefore confirm this generalised assertion. A thorough review of an airfield’s operational record books, for instance, may reveal that whilst it would have been a potential target, it was not bombed.

Relying on an assumption rather than researching the facts will often lead to unnecessary risk mitigation being employed and is hardly likely to provide the developer with any comfort that the potential UXO hazard on their site has been understood.

A failure to corroborate and check records is often perpetuated from the preliminary to the detailed risk assessment stage on a single site. An example of this regarded a site that was identified as an artillery range in a preliminary assessment, giving good justification to

undertake a detailed assessment to determine the potential UXO hazard. In practice the range was over 20km away from the site and yet the detailed study still made the same factual error, perhaps another reflection of the reliance of some UXO specialists on outdated and inaccurate databases, in addition to a lack of quality control. These issues lead to unnecessary risk mitigation expense for the developer, which could be avoided by the UXO specialist using properly corroborated evidence.

These errors are what the CIRIA guidance is trying to eradicate but have sadly become testament to the attitude that some UXO specialists seem to be adopting when undertaking risk assessments. It almost appears that some UXO specialists stop any further assessment once they have identified a potential hazard. They are apparently happy to conclude a moderate or high risk for a site (without defining what such an assessment actually means), issuing their report in a matter of days whilst simultaneously opening up the prospect of follow-on mitigation work.

A professional UXO specialist should be trying to help a developer understand in greater detail the nature of the UXO hazard on their site and so ensure that any requirement to undertake significant risk mitigation is appropriate and proportionate to the hazard and the intended works.

Do you know what you are looking at?

Even readily available and frequently consulted data sources are known to have been misinterpreted, leading to significant repercussions for the developer.

An example of this is the London bomb damage map which is one of the most commonly used sources of information for UXO risk assessments. It provides a colour-coded plan identifying the severity of bomb damage caused to buildings during WWII. Figure 2 below is an example extract. Essentially, the darker the colour, the more severe the damage. Black indicates a destroyed building, purple, red and pink indicate severe damage, whilst orange and yellow indicate blast damage.



Figure 2: Extract from the London Bomb Damage Map

The maps can be corroborated with other sources such as ARP incident records and aerial photography. Yet this has not stopped some UXO specialists either misinterpreting the maps or using the information in a misleading way by inferring that lower levels of damage (orange shading) actually indicate severe structural damage, suggesting that a building received a direct hit from an HE bomb.

Such a misinterpretation can have major financial implications for a developer. Again, a simple corroboration of existing records, such as checking the level of damage visible on wartime aerial photography and consulting the available ARP records, could prevent such a failing. However, making a conclusion based on only one data source is common within the UXO industry, even when other sources of countering information exist.

Despite the goal of the CIRIA guidance, this is an example of where it appears that one UXO specialist will interpret certain evidence differently to the next.

That said, there is no excuse for inappropriately presenting straightforward factual records or for failing to verify evidence that could prove a major influence on determining the UXO risk level on a site. Once again, the importance of corroborating records should not be underestimated. A consultation of a second source could quickly highlight a basic error in the first source, save the UXO specialist from potential embarrassment and the developer from a hefty bill for unwarranted work.

Anecdotal evidence

Whilst aging memories can fade or become twisted and imagined, they can provide a useful starting point for any research and can also infill gaps within more formal records.

As the CIRIA guidance states: 'Anecdotal evidence of UXO will be available from many local sources such as local newspaper records, local historical groups and local residents'. Some of these will have conducted their own research into the area and can provide local knowledge not readily available from other sources. They may also have consulted records within local archives and can provide useful references for the UXO specialist to interrogate.

Despite these potential merits, the value of using anecdotal accounts in what needs to be a factual and objective report is a contentious issue.

Certainly, any anecdotal evidence used during a UXO risk assessment must be corroborated by other sources to lend it credence. Whilst it is accepted that records will not have been kept for all military activity, particularly during wartime, a UXO specialist should make a concerted effort to validate anecdotal evidence.

A recent example of this concerned a detailed risk assessment at a nature reserve which had been used as a Battle Training Area during WWII. A post-WWII memoir by a staff member at the reserve had suggested that when wading through wetlands he had come across an area 'pock-marked with mortar craters from a WWII battle school'.

Being an area of potential concern, the UXO specialist sought to determine whether such an observation was likely to be correct. Further research of WWII aerial photography did not positively identify the anticipated mortar craters. A visit to the site to speak to current staff confirmed that, to their knowledge, no remnants of mortars had been discovered in the wetland area during several decades of earth movements.

By corroborating written records of the Battle School - which did not identify the wetland area as a target or impact point during WWII - with the other available evidence, it was

reasonable to conclude that the former staff member had misinterpreted the natural terrain for mortar craters due to their knowledge of the wartime use of the area that probably encouraged the connection of every undulation and depression to military relics.

Whilst taking the anecdotal information seriously, by thoroughly interrogating it with recourse to other records it was possible to provide a confident conclusion that the area had a low UXO hazard level and therefore significant risk mitigation was not required. This was borne out by the subsequent ground works in the wetland area, which did not encounter UXO.

Like any source of information, the UXO specialist has to make comment on the validity of anecdotal accounts and attempt to verify their accuracy or highlight their relevance to the risk assessment.

Currently, there appears to be a reliance by some in the industry on using easily accessible internet-based anecdotal accounts to build up an impression of significant military activity in an area, implying that a hazard may exist on a site even if no positive evidence is presented to confirm such a supposition.

By their very nature, anecdotal accounts are emotive rather than strictly factual. People living through wartime, for instance, are likely to recall their feelings at the time rather than exactly where a bomb fell or where the local Home Guard kept its munitions cache.

Additionally, what an individual considers 'significant bombing' may be at odds with what the UXO industry defines as a significant bombing density. It merely relates to perception.

Anecdotal evidence should not be dismissed out of hand but used with caution until corroborating records either confirm or refute its content.

Experience of the extreme does not make it the norm

A developer employs a UXO specialist to take advantage of their experience and professional approach. Experience of operational military sites and other facilities such as explosives factories provides a unique insight into what can occur on such establishments that may not necessarily be recorded formally.

Where few detailed records remain, a UXO specialist should not resignedly conclude a high UXO risk simply because of a dearth of knowledge. They are being paid for their expert opinion and experience and are entitled to use it for the benefit of the developer. Such experience, if used objectively, can be invaluable.

The CIRIA guidance provides an insightful case study into using a qualitative approach to assess the UXO hazard on a site in the absence of detailed bombing records. Without informative ARP records it is still possible for the UXO specialist to use aerial photography, comparison of pre and post-WWII mapping and anecdotal accounts to make an objective assessment based on their experience of similar circumstances.

The citing of 'experience' in UXO risk assessments has, however, become disquieting, where the extremes are cited more commonly than the norm. For a UXO specialist to cite an extreme circumstance that may have occurred once in their experience, and present it as a normal occurrence, is both irresponsible and tantamount to scaremongering.

With relatively few UXO specialists in the UK, it is easy to make a play on 'expertise' and 'experience' without challenge.

This should not detract from the facts. Each risk assessment is a clean slate, requiring the same level of detailed research as the previous study and citing the likely hazards, not the unlikely extremes that may once have applied to a particular site.

For example, there is a tendency for some UXO specialists to put an emphasis on the undisciplined nature of the Home Guard - it is almost as if they have been using 'Dad's Army' as a source of their information - suggesting that its personnel were by nature unsafe in their use of munitions and in their disposal practices.

Whilst there are records of the Home Guard disposing of UXO in an unexpected manner, to present these as the norm and create a general rule based on 'experience' is just another way to exaggerate the UXO risk on a site.

Indeed, some UXO specialists seem to blight anywhere the Home Guard trod during WWII (which was most of the UK) as having an elevated UXO risk.

No one should be naïve to disregard the fact that the exigencies of wartime mean that for any military unit, standard protocols may not have been followed. This is not to say that such a reality should be used as a justification to imply that a hazard may be present across every military establishment, such as airfields, barracks and training areas.

As with the Home Guard, the UXO disposal practices of regular troops are constantly called into question by UXO specialists in a generalised manner, without any recourse to site-specific evidence.

What then is the difference between the disposal practices of the voluntary Home Guard and regular military units? If none exists, then why attribute great significance to it? Such practices simply become part of the low background risk applicable to all sites in the UK, unless supporting evidence to the contrary is found.

A risk assessment should be evidence-driven with the focus on the site in question, citing similar examples where appropriate but not as justification for a vague risk assessment, in lieu of thorough research.

A UXO specialist that makes the extreme and rare appear to be the norm will undoubtedly feel vindicated when ordnance is found on a site identified as having a low UXO hazard level by another specialist.

In practice, they are simply using this extremely rare occurrence to justify the countless occasions when they have undertaken UXO risk mitigation without good reason, further perpetuating their proclivity for erring on the side of caution because it generates more work.

The experience of UXO specialists, when applied correctly, is an invaluable tool in aiding the understanding of potential UXO risks on a site. As the CIRIA guidance demonstrates, it is particularly useful for sites with a complicated military history or those where few documentary records are available. To use experience as a cover for poor research and a desire for winning follow-on mitigation work devalues the expert status of UXO specialists in general.

Location and Land Use

The CIRIA guidance is clear that the location of a site and its land use, both present and historic, will have an impact on any UXO risk assessment.

Indeed, the site location often provides a logical starting point for any risk assessment. If the site is in London then the likely focus will be on obtaining bombing records to determine the potential for a UXB hazard to exist. If the site is on an isolated moorland in Yorkshire, then the focus is likely to be other potential sources of UXO (such as military training, bombing decoys and aircraft crashes).

Simultaneously, if a site is a known former military airfield, firing range, munitions factory or alike then there are certain sources of information that will need to be consulted at the earliest opportunity in order to understand the potential hazard.

Of course, all sources of UXO hazard must be assessed but the historic location and land use of a site (confirmed by historical maps and aerial photographs) provides a sound initial reference point.

Considerations of site land use are crucial for three key reasons:

- 1) To determine the likelihood of the site being a strategic target for wartime bombing.
- 2) To ascertain the potential for a UXB to have fallen on the site unnoticed.
- 3) To assess whether any military activity likely to provide a source of UXO hazard occurred on the site.

What is important to emphasise is that historic land use alone does not create a UXO hazard, even on former military sites. There has to be a viable source of hazard. As the following section shows, this is not a philosophy always exhibited in the UXO industry, despite the CIRIA guidance.

Would your site have been targeted?

There is a general rule propagated by the CIRIA guidance that sites located in the centre of large cities are more likely to have a potential UXO hazard from aerial bombing than sites in rural areas.

This is not to say, of course, that every site in London will have a UXB hazard. There are countless examples of UXO specialists making bland statements along the lines that London was heavily-bombed during WWII and therefore the potential of encountering UXB is high.

What always needs to be taken into account is the location of the site, whether it was a strategic target or whether it was near to one.

The same logic needs to be applied for rural sites. Just because a site was in a remote location does not mean that it will necessarily have a low UXB hazard. The Luftwaffe built up a vast portfolio of potential targets, even in rural locations where they identified ordnance factories, railway junctions and military camps amongst other regional targets.

Additionally, bombing decoys were established in remote rural locations to deflect bombing away from major cities, port and industrial facilities. These are a potentially significant source of UXB hazard for rural sites, even if there were no obvious targets for miles around. Whilst the locations of most of these decoys are well-catalogued, there has been at least one occasion when a UXO specialist has failed to realise that their site was occupied by a bombing decoy, an oversight that was fortunately rectified by a more thorough detailed desk study and risk assessment.

Information regarding site location is important at the preliminary stage but needs to be interrogated through the detailed research advocated in the above sections. Regardless of

the site location and whether it might have been bombed, detailed records need to be obtained to properly assess the potential UXO hazard. Parts of London were of course heavily bombed but vast swathes remained unscathed, even if located close to potential targets.

Likewise, not every bombing decoy was successful and some were in operation for only a very short period of time. To conclude a high UXB risk because a site was the location of a bombing decoy, even when no positive evidence is presented to demonstrate that it was successful, is poor practice. Sadly, some UXO specialists regularly adopt such an approach, even elevating the hazard level in areas surrounding a decoy site based on its proximity rather than any evidence that it was actually bombed.

Conversely, a rural site located nowhere near any strategic targets or bombing decoys may still have a UXB hazard. Although this is an unlikely scenario, German aircraft regularly jettisoned unused bombs on their return to Europe, some of which were deliberately designed to remain unexploded. Again this emphasises the importance of obtaining detailed aerial photography and other records, rather than relying on generalisations.

Observations

The land use of a site during wartime will have implications for whether a UXB impact would have been noticed. If a site was occupied and subjected to frequent inspections after air raids (a typical practice for railway property and other important strategic sites) the probability of a UXB having fallen unnoticed decreases.

On the other hand, open waste land or rural areas would not have been considered an essential inspection point for ARP wardens and therefore the probability of a UXB having fallen unnoticed here is greater.

For such considerations to become pertinent, a potential hazard must exist in the first place.

Once a UXO specialist has determined that a site has been bombed they must then assess the possibility of a UXB remaining and at this point the land use of the site becomes relevant.

The historic land use of a site should not be presented as the cause of a UXB risk itself. Many UXO specialists appear to offer the conclusion that unoccupied or rural sites have a higher probability of UXB being present when compared to sites undergoing more observation or inspection. Even if no records have been found indicating that these sites were bombed, they often conclude a moderate UXO risk simply because of the potential that a UXB was missed. This, again, could apply to any remote site in the country and therefore forms part of the low background risk of UXO in the UK, something that can normally be discounted through the use of corroborative sources.

Just as a lack of occupancy on agricultural land is used to justify an elevated risk from unnoticed UXB penetration, the same logic should therefore lead to a reduction in the UXO risk for a site that was occupied throughout WWII. This is rarely the case and such a contradictory approach is misleading and invalid if not applied equally to all types of sites.

It is first and foremost important to ensure that the potential for UXB to be present is established. This potential will be tempered where a site had a high level of observation or inspection (e.g. in an urban area). The hazard level should be no greater than the originally

identified potential for UXO if a low level of observation or inspection during WWII is anticipated.

Was your site used by the military?

Many sites will have a known military history that provides a potential source of UXO hazard. Former airfields, explosives factories, firing ranges, military camps and barracks proliferate across the UK and offer an array of development opportunities.

Whilst these sites offer the potential for a range of UXO hazards to be present, this should not automatically blight development. A UXO specialist is not being paid to tell the developer what they already know. E.g. the site is a former ordnance factory and therefore has a high potential risk of UXO.

It is the job of the UXO specialist to provide a thorough understanding of the operations of such sites, indicating what types of hazard are likely to be present and where, potentially identifying areas where the risk is lower. This allows for appropriate risk mitigation measures to be put in place.

The reality amongst many UXO specialists in the industry remains that if a site was a former military establishment, it automatically has a moderate or high UXO risk. There is often no attempt to identify what types of ordnance may be present, making any recommendations for mitigation potentially unsuitable, increasing both the costs for the developer and also the risk posed to site workers.

As alluded to above, UXO specialists are being employed to demonstrate their experience of dealing with such establishments, not to state the obvious. Why should a developer pay for a detailed risk assessment that does not nothing but reiterate what a cursory glance on the internet would show?

Of course, identifying land that has been used in the past for military activity is not always so straightforward. Whilst certain large tracts of land have been set aside as designated training areas, any open space could theoretically have been used by the military, particularly during wartime when training requirements dramatically increased.

It is therefore essential on greenfield sites, in particular, that the potential for past military use is considered. This requires the same level of tenacious research as when dealing with bombing or other sources of UXO. In particular, it requires looking beyond the readily available set of databases typically checked by some UXO specialists.

On many occasions, an obscure archaeological report, a military requisitioning order for use of farmland or an aerial photograph can identify otherwise unrecorded military activity.

This does not, of course, necessitate that every area of open park or farmland in the UK has a UXO hazard associated with it. Yet, unfortunately, some UXO specialists appear to take this view as an alternative to undertaking detailed research.

Again, it is common for many UXO specialists to make general statements about how farmland was requisitioned by the military during WWI and WWII and how therefore the potential of uncovering British UXO on a rural site is a distinct possibility.

Such a suggestion is not completely unreasonable in the sense that nothing can ever be totally discounted during wartime. But just because something cannot be ruled out does not

mean that it happened (the norm vs the extreme again). An elevated UXO risk for British ordnance should not be assigned as a result of a lack of knowledge but because of positive evidence that military training occurred on a site.

Aerial photography would usually be sufficient to determine whether a site was used by the military or simply for agriculture. Yet, as demonstrated above, it is rare that UXO specialists endeavour to attain such a resource, essentially leaving them (and the developer) in the dark and overly-reliant on wildly generalised suppositions.

Such a lack of clarity is indicative of the frequent failure of UXO specialists to corroborate records, leading to general statements that could ultimately be used to identify a UXO risk on every rural site in the country.

Airfields

Very few WWII airfields have been substantially redeveloped. Developers are increasingly recognising the potential to use such sites for solar farms, housing or other developments. Indeed, the land bank offered by Britain's military past is recognised to present a significant opportunity to developers across the country.

By their very nature former military sites such as airfields can be associated with a wide range of potential UXO and other military-related hazard sources. The majority of airfields had munitions storage and disposal areas, weapons practice ranges, aircraft breaking areas, and a whole host of other features that can provide a potential source of UXO.

Of course as strategic targets many airfields were bombed and therefore there can be an associated UXB hazard.

In the vast majority of cases, these sources of UXO are discrete, contained and rarely widespread. Consequently, whilst there is a potential to find a wide range of UXO from the smallest bullets to the largest bombs, these are most likely to be in distinct locations and can be identified through a thorough risk assessment.

This fact is clearly outlined in the existing CIRIA guidance but apparently ignored by some UXO specialists. The guidance even provides a case study dedicated to dispelling the myth that the entirety of a former military airfield will have a UXO risk.

This reflects the operational requirements to keep parts of an airfield free of UXO. For instance, the runways, landing area and technical facilities would not have been logical places to store or dispose of significant quantities of ordnance as a standard practice.

By obtaining detailed site plans, a range of aerial photography and operational records books for the airfield in question, these potential locations can often be identified with some confidence.

It remains common, though, for many UXO specialists to assign an entire airfield site as having a high UXO risk, with adjacent land assigned a moderate risk simply because of its proximity to the airfield. There are even examples of reports citing pipe mines on adjacent airfields as being a potential source of UXO hazard. This is contrary to the clear example provided in the CIRIA guidance.

A particularly striking feature of some industry reports is how they are littered with examples of UXO having been found at former military airfields in the UK. Whilst there is no reason to

doubt that these UXO finds actually occurred, the examples taken are often from airfields with a completely different layout and operational history to the site being assessed.

Again, a UXO specialist has the potential to use their experience of working on airfield sites to the benefit of the developer. Unfortunately, it is often the case that they use it to the developer's detriment.

Defining Hazard Levels, Risk and Mitigation Requirements

As the previous sections have showed, some UXO specialists apply poorly defined risk classifications, with the facts presented often at odds with the conclusions.

This can provide the complete opposite to the aim of clarity, objectivity and consistency advocated by the CIRIA guidance.

Defining hazard and risk levels

We all use the term risk when we mean hazard and vice versa. But sections of the UXO industry have an even worse habit where the difference between low, moderate or high hazard (or risk) level is simply not defined, along with the requirement for action thereafter.

To make matters worse, the use of 'low to medium (moderate)' or 'medium (moderate) to high' risk levels is commonly used, seemingly to hedge bets and presumably due to the typical erring on the side of caution philosophy adopted in lieu of undertaking thorough research.

The implications of this wavering can be quite significant for the developer, particularly on a low-moderate site where the recommendations for risk mitigation will naturally be commensurate with the higher risk level.

Of course, good practice would be first to define what a low, moderate or high UXO hazard level is. It is possible to provide a simple explanation, with clearly defined boundaries from very low to very high hazard level along the lines of the below table:-

Definitions of UXO Hazard Level for a Site	
Hazard Level	Definition
Very Low	There is positive evidence that UXO is not present, e.g. through physical constraints or removal.
Low	There is no positive evidence that UXO is present, but its occurrence cannot be totally discounted.
Moderate	There is positive evidence that ordnance was present and that other uncharted ordnance may be present as UXO.
High	There is positive evidence that UXO is present.
Very High	As high, but requires immediate or special attention due to the potential hazard.

Assessing the hazard level is all about being reasonable. If there is no positive evidence to indicate that UXO may be present on a site, then it is reasonable to assume that it is unlikely that UXO does exist on the site, doing away with the more ambiguous low to moderate risk level.

Like any area of the UK, unless a site has been actively cleared of UXO (so designated a very low hazard level), there is no guarantee that UXO cannot be present. It is therefore always advisable to ensure that even when a low hazard level is concluded, a precautionary approach of sensitising site staff to the background UXO hazard through site inductions is carried out. This means that in the very unlikely event that something suspicious is found, appropriate action is taken and a reassessment of the hazard level is conducted.

Developers can gain comfort from the fact that in practice finding UXO on a site deemed to have a low UXO hazard level is very rare and that a risk assessment derived from thorough and corroborated research is overall going to offer a safe environment. This is in contrast to the poorly researched UXO risk assessments that advocate extensive and costly risk mitigation that may be addressing hazards that do not even exist and in fact miss the real risks on the site.

Some UXO specialists will assign a higher risk level to a site because of the 'devastating' consequences of detonating UXO. There is no doubt that the repercussions of detonating UXO (particularly UXB) could be catastrophic, but the whole process of risk assessment relies on an appropriate balance of consequence versus likelihood.

A lack of confidence in their research leads some UXO specialists to put more weight on the probability of detonation which, using a numerical assessment process, naturally leads to higher risk levels being determined for a site.

Whilst we should never be complacent when addressing UXO issues, on the majority of sites in the UK a developer would be extremely unlucky to encounter UXO. Yes, the consequences of accidental detonation could be severe, but for that unlikely possibility to even be contemplated there has to be credible evidence that UXO might be present.

The poor definition of UXO hazard levels, and so consequently UXO risk levels, means that some UXO specialists recommend extensive risk mitigation measures with little substantiation.

The often routinely provided low-moderate risk level typically results in UXO specialists recommending that an Explosive Ordnance Clearance (EOC) Engineer be present for any excavations on a site. This is a potentially lucrative revenue earner for UXO specialists but is often wholly unjustified.

By defining the hazard level at the start, it becomes more tangible for the developer to understand that the presented likelihood of encountering UXO is balanced with the scope of work and the consequences of detonation, so that the recommended mitigation is commensurate with the identified risk.

There are numerous examples of desk studies and risk assessments that confirm that there is no military activity, no WWI or WWII bombing, or any other sources of UXO associated with the site, but incongruously significant UXO risk mitigation measures are recommended.

Any risk mitigation recommendations must naturally bear some relation to the UXO risk assessment, and recommendations should differ considerably depending on the identified risk level on a site and the developer's proposed works.

Some UXO specialists still seem to raise the spectre of an explosion on a site, and use the emotive connotations of such a potential incident as a way of bypassing the factual evidence they have gathered to proceed towards more costly mitigation.

Zoning the UXO hazard level

For all sites, zoning of the UXO hazard level should be a natural result of a detailed UXO risk assessment. This ensures that any recommended risk mitigation is applied to those areas where it is required and where possible enables a developer to better plan or, if necessary, redesign their development phases, potentially offering considerable cost savings.

Even in areas of heavy bombing or significant military activity, large areas of a site can still be assigned a low UXO hazard level based on obtaining detailed records.

A standard starting point for a UXO specialist should be that all sites have a low UXO hazard level and this will only change if there is positive evidence from the historical records that a potential hazard exists. Even then this hazard will often only affect discreet areas, allowing a zoning of the hazard level.

A UXO risk assessment must therefore endeavour to identify the actual type and likely location of ordnance anticipated in order to derive appropriate risk mitigation. Failure to do this can result in an inappropriate risk mitigation programme whereby the developer spends considerable amounts of money without achieving any further benefit.

Some UXO specialists seem to neglect such an approach, instead assuming that some form of UXO hazard exists across a site regardless of the historical records.

Where a zoning of the hazard level is attempted it is often just due to land use and not the actual density of bombing or alike. For instance, if a building remained intact during WWII it may be assigned a low risk, yet an adjacent allotment may be assigned a moderate risk even though in both cases there are no records of bombs falling on the site.

Whilst an attempt to zone the UXO hazard level on a site is admirable, it becomes less useful when based on a flawed logic that offers little sound reasoning for the differentiation presented.

The Cost of Getting it Wrong

A poorly researched and executed desk study and risk assessment can obviously incur the ultimate price and put lives at risk.

The same lack of thorough research, combined with a non-objective view, can similarly cost UK developers millions of pounds through unnecessary risk mitigation, which has probably meant in the past that some developments did not go ahead.

It is routine to be asked to price £100,000s of UXO risk mitigation work, only to find that the evidence presented for the recommended works shows little if any justification for the works.

By investing in a detailed risk assessment the developer is more likely to receive a thoroughly-researched and properly corroborated report that provides a confident conclusion, usually resulting in a lower UXO risk being identified for all or at least key parts of a site.

Obtaining a cheap UXO risk assessment produced in only a couple of days is only likely to result in greater costs in the long term.

Conclusion

The CIRIA guidance was written in order to dissuade the more unscrupulous practices of some UXO specialists and was keen to emphasise their stated role:

‘The role of the UXO specialist should be to provide expert knowledge and guidance to the developer on the most appropriate and cost effective approach to UXO risk management at a site. This should include an assurance of unbiased advice on any risk mitigation measures required. It is not suggested that UXO specialists have in the past deliberately misled clients but it is apparent that, with no formal guidance in place, the level of service provided has been inconsistent’.

Whilst the CIRIA guidance has offered a great starting point to try and provide a consistent and trusted approach to addressing the UXO hazard within the UK construction industry, there is clearly still a long way to go to reach this target and it all starts with the risk assessment stage.

If you feel that the most consistent thing about your UXO specialist is that almost all of their reports conclude a medium or high UXO risk, then perhaps this paper will help you challenge them on their compliance with the CIRIA guidance.