Best practice in record keeping for explosives

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Regulation 12 of Control of Explosives Regulations 1991 (COER) requires anyone who acquires or keeps explosives that require an explosive certificate, to maintain up to date records of the explosives. This article is intended to give practical guidance on how to maintain accurate records that are simple and easy to understand both by users and regulators.

What is a record?

A record is an accurate statement of the acquisition, storing and eventual use or disposal of explosives. For a record to be accurate, the different types of explosives must be clearly defined. For example detonators with different delay times, length of wire or wire colour need to be recorded separately. For cartridged explosives, those of different lengths, diameter, or weight should be recorded separately. The specific requirements relating to explosives which differ in type or make-up are detailed in Schedule 3 to COER.

Format of the record

COER does not prescribe the form that the record should take. The nature of the record will depend on the circumstances, for example how often issues are made and how many different explosives are used. The record should be on paper and may be in loose leaf or bound form, but pages should be sequentially numbered so that it is easy to identify if a page is missing. Don't try and cram too much on one page - have blank columns or continuity pages to cover new items.

Computer records have the advantage of removing arithmetic errors (often the cause of discrepancies in paper records). However where records are kept on computer, there will need to be systems or procedures ensuring the information is secure against loss should the system or power fail. Printing off and keeping the record for each stock change may achieve this. Doing this also provides an audit trail to establish if any computer record has been amended, otherwise the computerised system will need to have facilities indicating clearly where and when changes have been made and by whom.

In view of the requirement in Regulation 12(2) to preserve records for three years from the end of the year of the last entry, starting a new record each year provides an effective cut off point for calculating the cycle.

Methods of recording

Store records

Store records may be kept in any format, but the style of record should reflect the items that are likely to be stored. Those who use a limited range of explosive will have much more condensed records than others. The key issue is that the format chosen is easily understood and capable of being retained for the three years required by COER.

It is particularly important that any loose-leaf system has the pages consecutively numbered. Where damage occurs to pages, it is acceptable to transfer the information to the next page and strike out the entries. The damaged pages, should ideally be left in the record book. If they have to be removed the fact and reasons for this happening should be recorded,

Shot firer's record

Where explosives are drawn from store, or delivered to a blast location, a record is required to be made by the person who receives the explosive. The shot firer's record or day book needs to follow the requirements for those who acquire explosives in COER. This record is a basic listing of the items, by their individual designation and description and the number of articles or amount of substance received. After the shot has been set, the record should then be marked up with the explosives committed and indicate what has not been used. Once those items are returned to store or destroyed at site, the record should be marked off accordingly. It is important that these records also are retained for the three year period specified in COER. They provide additional information to cross check if a store audit discovers a deficiency in stock. Shot firers records should tally with the store records allocation and return figures.

Common errors

Errors in stock records come from a number of sources:

- Arithmetical – incorrect addition/subtraction
- Transposition of digits – e.g. writing 347 instead of 374
- Miscounting
- Manufacturers/suppliers error – incorrect quantity marked on the box
- Using volumetric dispensing instead of weight.

Detonators – miscounting at the manufacturer leading to shortage or excess over declared content, e.g. 9 or 11 detonators in a bag instead of the declared 10

Cartridged explosives – variations have occurred in which a cartridge of slurry type has been missed from a box. In the larger weight (5 kilograms) cartridges it can be obvious to the shot firer/storekeeper when handling the case. If that is noted, then the package should be left sealed and the supplier advised.

Errors can creep in if for example the supply package contents change without being noticed, e.g. the box contents change from 25 kg to 20 kg.

Particular care needs to be exercised for articles such as cast primers, where they may be bought in boxes of 25kg, but are issued and used in unit quantities. Any quoted content by units should be matched by the actual content once a case is opened.

Gunpowder – is usually supplied boxed or packaged by weight, but may be dispensed into smaller containers or bottles when issuing for use. An assumption is often made about the weight of gunpowder in a bottle, and this is used in recording quantities less than a full box. Because of variations in the bulk density of the powder and the degree of consolidation in the container, there can be considerable variation in the actual weight of the container contents. If this method is used, the weight needs to be checked at suitable intervals.

Common discrepancies at receipt

There may be discrepancies between the stated contents on a box and the actual content due to packing errors, therefore box contents should be verified. If it is not practicable to do this at the time of receipt, because of the number of boxes involved, or there is not a safe place to undertake the check, it is acceptable to take the quantity on the box at face value until the box is opened. Ideally whenever a box is first opened, the initial check of the contents should be witnessed by another authorised person. Any discrepancies found at this stage should be brought to the attention of the manufacturer/supplier and the relevant explosives licensing authority informed so that enquiries can be undertaken.

Other issues

For confirming stock entering and leaving a store, there should be a system involving two people verifying the movement. In some cases, due to staffing levels etc, this will not be possible. In those cases the stock should be subject to a regular audit check by the manager or other person nominated along with the shot firer or storekeeper. Due to familiarity, there is always the chance for error where the single person who deals with the normal operations in the store also audits the stock.

Recording quantities

Units of accounting – In addition to complying with the requirements of Schedule 3 of COER, the units must be appropriate for the nature of the explosives and be a suitable measure of receipt, issue and use. The most common units being weight (kg) dimension or count.

There may be some decisions to be taken e.g. are cast primers delivered by weight or count? Using the weight of these items makes accounting more difficult and care needs to be exercised in order to prevent reconciliation errors when, because of variations in the weight of individual primers, the number of units in a box may vary. Whether units or weight are chosen, you should be able to readily reconcile the contents of a box against the quantity used.

How to correct recording errors

Where errors are found, the person making the record most often discovers these at the time. When this happens, the figures should be corrected by crossing the incorrect figure out with a single line and the correct figure entered adjacent to the incorrect entry. The correction should be initialed and dated at the side, or at a suitable place on the record page. To assist when the record is examined later, it would also be helpful to add an explanation e.g. “wrong figure entered”. Writing over the incorrect figure or use of correction fluids is not good practice as it leads to additional confusion.

Where a stock check has found an error arising from an earlier sheet the correction should be made as above on the current sheet, indicating the sheet number from which the error arises. The earlier sheet should also be endorsed. It will not normally be necessary to transfer the amended figures to every intervening sheet.

When to report losses

Regulation 13 of COER requires losses of explosives to be reported to the police. HSE must also be informed if the loss occurs at a site licensed by HSE. Losses include thefts or suspected thefts and misplaced explosives, but discrepancies that can be shown to be accounting errors do not need to be reported.

Where should records be kept?

Records of the stock in the store should not be kept in the store. Records are used not only to allow the proper management of stock rotation, but as an information source in the event of any loss or theft. Keeping records with the explosives could result in the theft of explosives with the records also being removed. The records should ideally be kept locked in a secure location on the site. Appropriate places would be the site office, shot firer’s equipment store, or at isolated locations, the secure alarmed housing for the alarm equipment.

Stock checking

The storekeeper should undertake periodic stock checks at a frequency determined by the explosives turnover. Weekly is generally appropriate, but at stores with limited usage this may be less frequently. In addition there should be a periodic “independent” check by someone who does not normally get involved in the day to day operation of the store e.g. quarry or mine management. This may be monthly or quarterly, depending on the turnover. Whenever a stock check is done, the appropriate record should be endorsed to indicate when the check was undertaken, by whom and the outcome of the check.

When are explosives recorded as "issued"?

In storage records, explosives should be treated as "issued" when they are removed from the store. An entry should be created at that time of issue and updated in the event of any returned explosive. Shot firers will in many cases issue to themselves. While not best practice, it may not be practicable in all situations for a second person to be involved. The store record and the shot firer's record should give a clear indication of the stock levels at any time.

Example

In the following example, the site has detonators, primers, cartridged explosives and packaged ANFO.

1. The record is a daily stock sheet that shows issues on a single shift. Issues to different shifts can be shown separately if appropriate.
2. The "explanation" section is used to clearly describe and identify the explosives. Alternatively the same detail could be entered in the column heading if it will fit.
3. "Transfers in (receipts)" is used to record receipts from suppliers or other companies or transfers from other stores. The supplier is identified in the explanation section.
4. "Transfers out" is used to record explosives passed on to another individual or company elsewhere (off site). The recipient is identified in the explanation section

Example

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Control of Explosives Regulations 1991 - Record made under Regulation 12

Name of Place……

Date …….. **Day ……**

	Detonators									
Delay Time	**0**	**2**	**4**	**6**	**8**	**9**	**11**			
Opening stock	1117	793	772	614	513	685	165			
Issues	84	42	56	55	54	54	14			
Issues										
Issues										
Balance	1033	751	716	559	459	629	151			
Transfers in (Receipts)	-		-	-	-	-				
Transfers out					120					
Returns -	-	12	-	-	-	10	-			
Returns -		-	-	-		-				
Returns -		-	-	-		-				
Closing Stock	1033	763	716	559	339	639	151			

	Primers	Cartridged Explosives			Bulk Explosives	
	Total (units)	Total (cartridges)			No of cases	Total weight
Opening stock	4724	303			40	1000
Issues	359				16	400
Issues						
Issues						
Balance	4365	303			24	600
Transfers in (Receipts)	1520	100				
Transfers out						
Returns						
Returns						
Returns						
Closing Stock	5885	403			24	600

Signature (person making record) Counter signature

……. ……

Explanation
Detonators = No 8 Aluminium tube 4.0 m green insulated wires. The number indicates the delay
Cartridged Explosives = Orex Silver 100mm x 2.5kg (10 per case)
Bulk Explosives = Ammoblast 25kg bags
Primers = Riobooster 150 g (152 per case)

10 Cases of Riobooster primers received from XXXXX. Delivery note No 123456
10 Cases of Orex Silver received from YYYYY. Delivery note No 654321
120 off No 8 , 8ms detonators transferred to ZZZZZ mine, order No 345213

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