RISCAuthority

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FPA Fire Protection Association

Security Bulletin: Alarm Transmission Systems (ATS) – technical update for insurers and other stakeholders

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Contents

1 Scope

This guide outlines key aspects of the previous/current (old) and developing (new) standards regime relating to Alarm Transmission Systems (ATS); and also suggests means by which insurers, and other specifiers, might more readily identify and specify/accept ATS to better meet their, and their customers', needs.

2 Introduction

As is often the case, to understand the present we need to also consider the past.

In 2005, the compulsory adoption of a suite of European Standards ('Euro Stds') in the UK saw a major change in the rules providers of equipment for use in Intrusion and Hold-up Alarm Systems (I&HAS) had to observe, and that regulated alarm companies, e.g. those supervised by the police recognised 'Inspectorates' i.e. National Security Inspectorate (NSI) and the Security Systems and Alarms Inspection Board (SSAIB) had to follow in the design, installation and maintenance of such systems - plus any associated ATS.

For reference, the headline Euro Stds (which have various subsidiary parts not shown here) adopted in 2005 were:

- PrEN 50131-1: 2004 Alarm systems - Intrusion and Hold-up Systems. Part 1 – System requirements
- DD CLC/TS 50131-7: 2004 Alarm systems– Intrusion systems– Part 7: Application guidelines
- BSEN 50136-1: 1998 Alarm systems – Alarm transmission systems and equipment. Part 1 General requirements for alarm transmission systems.

Notes

1/ prEN 50131-1: 2004 was an advanced draft update of BSEN 50131-1: 1997 which later became BSEN 50131-1: 2006. For simplicity the term BSEN 50131-1 is used in the remainder of this guidance document, but could refer to either version according to the date under consideration.

2/ Updates (A1, A2, etc) to stated standards are periodically published.

Because the Euro Standards were not fully complete in 2005 and parts were in updated draft form, the available parts were introduced into the UK for use alongside remaining valid parts of BS 4737, via an enabling scheme document referred to as PD 6662: 2004 (updated in 2006 and 2010).

PD 6662 also set out requirements for matters not covered in the Euro Standards, e.g. time intervals for system maintenance* and created a Notification Option for 'Audible Only' systems, i.e. Grade 2 Option X – usually referred to as Grade 2X.

*__Note__. *Maintenance guidelines were included in TS 50131-7 but did not mirror current UK practice and, in particular, UK police requirements for systems with a URN. A separate UK document, DD 263, was later developed to cover this topic – eventually becoming BS 9263.*

The complexity of this new regime coupled with areas of the related standards that were not crystal clear, plus the introduction at around the same time of new ATS technologies, e.g. use of the Internet Protocol (IP), led the RISCAuthority to investigate a variety of relevant issues. Subsequently, various guidance documents were issued of which, in the context of this guide, the following are particularly drawn to readers' attention.

- Alarm signalling using the internet protocol Part 1: An overview
- Alarm signalling using the internet protocol Part 2: Considerations for insurers

  Note. *This 'Part 2' document was replaced in 2013 by a RISCAuthority document (for RISCAuthority members only) titled 'Report to Insurers: Intrusion alarm signalling using the internet protocol'*

- S15: Guidance on evaluating the performance of alarm transmission systems for use with intrusion and hold-up alarm systems

  Note. *This document highlighted the various areas of concern in the Euro Stds relating to ATS and suggested how they could perhaps be resolved by a suitable regime of third party certification. The Building Research Establishment (BRE Global) subsequently issued a document called 'LPS 1277 3.0: A specifiers guide', which suggested that their revised LPS 1277 scheme (' Requirements for Loss Prevention Certification Board (LPCB) Approval and Listing of Alarm Transmission Equipment') dealt with/resolved most of the issues identified in the S15 document - and thus could provide a means by which insurers, and others, might have greater confidence in suitably certified ATS, and thus more easily and impartially specify/accept them.*

- Security Bulletin: SB 02.2011 Alarm Transmission Systems (ATS) – Loss Prevention Certification Board (LPCB) launches revised Loss Prevention Standard, LPS1277 3.0

  Note. *This document drew insurers' attention to the LPCB 'specifiers guide' and in the absence of clearer Euro Stds and/or a separate UK British Standard for ATS supported the case being made by the BRE for use of LPS 1277 certified products.*

- S17: Intrusion and Hold-up Alarm Systems: guidance on event processing and handling

  Note. *This document drew attention to the increasing type/number of events now being passed to Alarm Receiving Centres (ARC) and the lack of clarity that often exists in terms of when/how they are reacted to. It also proposed some 'model' tables for event handling to help ARCs, alarm companies and specifiers determine which events may be safely logged/held for a time and those which may need to be immediately acted upon.*

These documents (and many others) can be viewed and downloaded at www.riscauthority.co.uk

In the context of the date each was written, the available versions of the aforementioned documents are still largely valid – and not least in respect of ATS products currently in service which were made or installed at those times.

2.1 Causes of uncertainty

Whilst technical requirements for ATS were largely covered in the ATS standard, BSEN 50136, parts were also covered in the system standard, BSEN 50131-1. This overlap created areas of possible conflict/interpretation leading to some uncertainty of meaning which, given the importance of ATS to a premises' security if parts of them, or a connected alarm system, were to be attacked or fail, was considered by many to be highly undesirable.

ATS are differentiated by different levels of performance, the available choices being reflected within the formal Notification Options (aka 'signalling') that are permitted for use with each Grade of I&HAS, as shown in Table 10 of the then applicable system standard, i.e. BS EN 50131-1.

Notification equipment	Grade 1			Grade 2				Grade 3				Grade 4			
	Options			Options				Options				Options			
	A	B	C	A	B	C	D	A	B	C	D	A	B	C	D
Remotely powered audible WD	2	Op	Op	2	Op	Op	Op	Op	Op	Op	Op	Op	Op	Op	Op
Self-powered audible WD	Op	1	Op	Op	1	Op	Op	Op	1	Op	Op	Op	1	Op	Op
Main ATS	Op	Op	ATS 1	ATS 2	ATS 2	ATS 2	ATS 3	ATS 4	ATS 4	ATS 4	ATS 5	ATS 5	ATS 5	ATS 5	ATS 6
Additional ATS	Op	Op	Op	Op	Op	ATS 1	Op	Op	Op	ATS 3	Op	Op	Op	ATS 4	Op

Table 10: Notification requirements

Note. *The ATS categories shown in the table at each Grade are the minima, so use of an ATS of superior performance is permitted – and often desirable.*

An ATS of any particular headline performance level has various component performance parameters, e.g. for the level of substitution or information protection, speed of information transmission, etc; with these being defined in Table 11 of BSEN 50131-1. However, the main functional difference between ATS is how long ATS failures are allowed to take to be detected and reported - for action at an ARC. These reporting times are:

- ATS 1, 2 and 3 = 25 hrs
- ATS 4 = 5 hrs
- ATS 5 = 3 minutes, and
- ATS 6 = 20 secs.

At the time, some key ATS issues with the Euro Stds included:

- In a DP ATS, whether a dual path ATS is one ATS with two paths or, as implied by Table 10, two independent ATS of different type and performance.

  Note. *The UK industry routinely treated 'dual path signalling' as comprising one ATS with two paths- a (main) primary path and a (additional) secondary path*.

- In a DP ATS, whether remote checks (aka 'polling') have to be used to determine path failure or whether local interfaces within the Supervised Premises Transceiver (SPT) undertake the task, i.e. reporting failure of one path over the other – assuming it remains available.

  Note. The SPT is equipment at the supervised premises that interfaces the alarm system with the alarm transmission path(s).

- A large gap between the performance of ATS 4 and ATS 5.
- Where ATS of higher performance should be used in place of a stated Notification Option in Table 10.
- Whether requirements for 'Availability' (the percentage of time a system is working correctly) should be checked/met; as although referenced in the Euro Stds the related parts were omitted from the UK's adoption process.
- Many alarm companies, and ATS providers, referred to ATS products as having 'grade' 2, 3 or 4 performance; but from the table it can be seen that for ATS products with only one ATS (path) different ATS performance is required depending upon whether or not a remotely or self-powered Warning Device (WD) is being used – with the result that 'grade' cannot be reliably used to describe performance of single path ATS.

Note. *For a full explanation of the various issues/concerns raised see S15: Guidance on evaluating the performance of alarm transmission systems for use with intrusion and hold-up alarm systems*.

As mentioned earlier, the LPCB updated and expanded their scheme for ATS certification to reflect and address most of the concerns raised in the RISCAuthority's S15 doc, and subsequently referred to their certified ATS products as having 'Enhanced' ATS performance values, e.g.' Enhanced ATS 5'.

2.2 Next steps

The LPS 1277 3.0 scheme for ATS certification, and the use of new technologies, proved controversial in some quarters. Whilst many ATS providers sought and obtained LPS 1277 certification for some or all of their products, not all did and there were never enough of them holding certification simultaneously for the scheme to reach critical mass - and thus become widely accepted and used by the alarm industry, i.e. independently of insurer-led specification.

However, it did spark useful debate and consultation amongst key industry players and bodies, with the end result that some of the long running issues and queries relating to ATS have since been clarified by being written into a new version of the Euro Stds for ATS, namely:

- BS EN 50136-1: 2012 Alarm systems – Alarm transmission systems and equipment. Part 1 General requirements for alarm transmission systems

  Note. *Whilst published for use from 30th September 2012, the latest Date of Withdrawal (DoW) of the previous version was set as 26th Dec 2014 so, as is usual, a period of 'dual running' was envisaged – when ATS providers and alarm companies could use products meeting the old or new versions of the standard*.

Amongst other significant matters, the new 50136-1 outlines a completely different set of (clearer) ATS performance categories (see section 4.0), and in that regard alone the UK intruder alarm industry might have been expected to be clamouring for its early use. However, its practical adoption (which effectively, at the latest, should have been from the start of 2015) was hindered by the fact that the alarm system standard, BSEN 50131-1: 2006 (by now revised and re-designated BSEN 50131-1: 2006 + A1: 2009), which guides alarm installers as to acceptable means of alarm Notification (via its Table 10) still referred only to the previous BSEN 50136-1 ATS categories and PD 6662: 2010 was also not revised in 2012, or immediately thereafter, to require use of the 2012 ATS standard.

This disconnect between the Euro Stds was finally resolved in 2017 by the long awaited publication of a revised BSEN 50131-1: 2006 + A2: 2017. This updated standard removed the few previous technical requirements relating to ATS (as they were now all in the 2012 version of 50136-1) and crucially included a revised Table 10 referring to the new BSEN 50136-1 ATS categories.

> **Note**. *This updated standard came into formal effect on 31st July 2017, and has a latest DoW for the previous version of 20 February 2020*.

Although updated Euro Stds were now published, the regulated UK alarm industry only works to the UK's enabling scheme for Euro Stds, i.e. PD 6662. This was also updated in 2017 to refer to these new/updated standards, and came into effect from 31 August 2017.

PD 6662: 2017 outlines a dual running period for the new and previous PD 6662 (2010) until 31st May 2019* – **meaning that compulsory use of the new Euro Stds framework becomes effective in the UK on 1st June 2019**.

> *__Note__. *This date is earlier than the February DoW for the updated BSEN 50131-1 but takes precedence*.

But for any remaining UK issues relating to ATS, (see section 5.0 on PD 6669), from late 2017 the UK alarm industry now has a coherent and clearer set of updated Euro Stds relating to I&HAS and ATS to which they can work. Although it is not possible to say exactly when individual alarm companies will start using them (as each will need to become familiar with their content, update their training and practices plus source the relevant equipment) it seems likely that from mid-2018 their use will become more commonplace – and increasingly so as the 2019 deadline for full adoption draws closer..

> **Note.** *Some ATS providers have been selling products certified to BSEN 50136-1: 2012 for some time but marketing them with information on 'backwards compatibility' with the ATS values of Table 10 of BSEN 50131-1: 2006. This works fine for products that have high performance, i.e. having high Availability and good levels of Substitution/Information security protection, but may not be suitable for others. See Appendix B for a simple comparison table of key requirements for DP ATS under the old and new standards regimes*.

With the outlined background information in mind this guide now looks at the key changes in the standards regime for ATS.

3 Selecting an ATS – BSEN 50131-1: 2006 + A2: 2017

The key change in the system standard relating to ATS is the removal of some technical issues relating to ATS (as now covered fully in the BSEN 50136 series) and the provision of a new Table 10.

Table 10 sets out various Notification Options (for local and/or remote ‘signalling’) that an alarm company is permitted to use with particular Grades of I&HAS, as shown:

Notification equipment	I&HAS Grade 1			Grade 2						Grade 3					Grade 4			
	Options			Options						Options					Options			
	A	B	C	A	B	C	D	E	F	A	B	C	D	E	A	B	C	D
Remotely powered audible WD	2	Op	Op	2	Op	Op	Op	Op	Op	2	Op	Op	Op	Op	2	Op	Op	Op
Self-powered audible WD	Op	1	Op	Op	1	Op	Op	1	Op	Op	1	Op	Op	Op	Op	1	Op	Op
ATS	Op	Op	SP1	SP2	SP2	DP1	SP3	Op	DP2	SP3	SP3	DP2	SP4	DP3	SP5	SP5	DP4	SP6

Key: Op = Optional

SPn = Single Path Performance Category, DPn = Dual Path Performance Category (refer to EN 50136-1)

Note 1: Digits in cells specify the number of audible warning devices ro be included by grade and option

Note 2: The requirements included in each grade and option represent the minimum requirements. It is permissible to include additional WD or to select higher performance ATS in any grade or option, e.g. to achieve a shorter reporting time

Table 10: Notification requirements

The key things to be aware of in this table are:

- It shows a simple mix of Single Path (SP) or Dual Path (DP) ATS of differing performance – as further defined in 50136-1: 2012
- At Grades 2 and 3 various permitted types of SP ATS exist, as before, but Notification Options now also include two different types of DP ATS.

  Note. *It is hoped that this will prevent the continued use of the colloquial term ‘grade’, as often used in the past to describe DP ATS, as continued reference to ‘grade’ 2 or 3 ATS would now cause confusion and misunderstanding - since for each Grade of I&HAS there are several possible DP ATS categories (of differing performance) that might be used. It is much clearer to state a Grade of I&HAS and then separately state either the ATS Notification Option to be used, e.g. 3E, or the desired* ***performance category*** *of an ATS, e.g. DP3.*

- Note 2 of the table confirms that it is acceptable to use a higher performing ATS, or extra Warning Devices (WD) with any Grade of I&HAS
- There is now an ‘Audible Only’ category for notification, i.e. 2E, which replaces the UK’s former Grade 2X as included in past versions of PD 6662

General maintenance requirements are still covered by TS 50131-7, but UK specific requirements for maintenance are now covered by BS 9263 - as called up by the latest PD 6662.

Taken together, the new regime may help break the past habit of some alarm companies of choosing a Grade 2 or 3 alarm system and then, rather simplistically, using the same ‘grade’ of ATS with it. In future a separate (ideally risk assessed) choice of which of several allowable ATS for each Grade of system will need to be made.

4 Selecting an ATS – BS EN 50136-1: 2012

Aside from the introduction of some new and revised definitions plus some minor technical changes, the main improved features of this standard compared to the previous versions are:

- Revised ATS performance categories, i.e:

  Single Path (SP) ATS from SP1 – SP6, with SP 6 being the highest performing

  Dual Path (DP) ATS ranging from DP1 – DP4, with DP4 the highest performing
- A DP ATS is clarified as being one ATS with two different Alarm Transmission Paths (ATP) and not two different ATS
- In a DP ATS, the former 'main' path is now referred to as the Primary ATP and the former 'additional' (secondary/back up) path as the Alternative ATP.
- In a DP ATS, the concept of 'stepped up' performance of the Alternative ATP, to match that of a failed Primary ATP, is recognised.
- In a DP ATS, the maximum allowed time to report ATS failure is set at twice the Primary ATP reporting time; in other words as a result of the (implied) sequential failure of the Primary ATP followed by failure of a stepped up Alternative ATP.

  Note. *In reverse, if the Alternative ATP should fail first it could potentially be a long time before the fault is picked up, but should the Primary ATP then fail that will be noted quickly and the Alternative ATP will then be checked for correct operation of step up, and any failure then reported as an ATS fail within twice the Primary ATP report time.*
- A DP ATS cannot rely upon interfaces within the SPT to monitor/report path failure – this has to be achieved by remote checks (aka 'polling').
- (Clause 6.7) Availability requirements exist for ATS of SP4 and DP2 performance, and above, and are clearly stated together with methodologies for determining the specified requirements. ATS providers are required to make this information available to alarm companies.

Some of these features are captured in the standard's Table 3, as below:

	SP1	SP2	SP3	SP4	SP5	SP6	DP1	DP2	DP3	DP4
Primary ATP Reporting time	32 d	25 h	30 m	3 m	90 s	20 s	25 h	30 m	3 m	90 s
Alternative ATP Maximum period when primary operational	Op	Op	Op	Op	Op	Op	50 h	25 h	25 h	5 h
Alternative ATP Maximum period when primary failed	Op	Op	Op	Op	Op	Op	25 h	30 m	3 min	90 s
ATS reporting time *	32 d	25 h	30 m	3 m	90 s	20 s	50 h	60 m	6 m	3 m
Key Op = Optional * Where an ATS includes more than two ATPs the ATS reporting time shall meet the requirements of this table.										

Table 3: Maximum reporting time

Some areas for possible concern include:

- In a DP ATS, the concept of 'catastrophic failure' (both paths failing at the same time) is not recognised in terms of requiring tighter (than sequential) ATS failure reporting times.
- For DP ATS, the ATS failure times (likely to become the default customer notification times), whilst clearer than before, are often less than the UK has been used to (many providers in recent years recognising the concept of catastrophic failure), and below DP3 are likely to be too long to facilitate effective human intervention in any related criminal event.

- In a DP ATS, reporting of failure of only one ATP to the alarm system (e.g. control panel) or the Receiving Centre Transceiver (RCT) is not mandatory – only ATS failure is. However, all ATP failures do have to be reported to the Alarm Transmission Service Provider (ATSP) for 'appropriate action'. (The RCT is equipment at the ARC that interfaces with the ATP(s) of the ATS).

  Note. *This could mean a user sets their alarm system without realising the ATS is not fully operative – which arguably is not of significant adverse effect on a premises' security if the ATS is of high performance, i.e. should the remaining path fail its loss will be quickly determined and reported to the ARC.*

- In a DP ATS Clause 6.3.3.3.2 says "ATP shall use diverse interfaces to connect the Supervised Premises Transceiver (SPT) to the transmission networks in such a way that a single tamper action on the transmission network cannot cause all ATPs to fail simultaneously".

  Note. *The phrase 'diverse interfaces' is open to some interpretation; not least as the definition of a dual path ATS elsewhere in the standard talks about such ATS using 'diverse technology'.*

  Although the use of a "fixed line ATP and a radio ATP using a mobile service provider network" is given as an example (Note 1 of the clause) of a compliant DP ATS, one wider interpretation of this clause is that two radio paths can be used - provided each has a separate connection (SIM) to different networks – and at least one ATS provider now offers products based on this understanding.

- In a 'hosted' (managed) DP ATS Clause 6.3.3.3.2 Note 3 says that "As long as service is not lost a single path line fault should be presented to the ATS provider, but can be delayed presenting to the (ARC) Annunciation Equipment (AE) where it is agreed between the interested parties."

  Given the way documents full of terms in the 'small print' are freely signed by customers, and the often seeming lack of transparency in customer and alarm company/ARC/ATS provider relationships, it seems likely that this non-reporting will become the industry default. **Arguably this should not unduly concern insurers provided**:

  - ATS fully meet the other requirements of BSEN 50136-1, ideally as proven by third party certification
  - Catastrophic ATS failure can be detected/reported – see PD 6669
  - The ATS provider or ARC has a suitable system for storing such events and correlating them with further ones, e.g. another path failure or alarm activations/ faults, to indicate to an ARC/keyholder, in the context of confirmation I&HAS, that a confirmed event has occurred – see PD 6669.

- There is still a big gap between SP4 and SP3 fault reporting performance, and DP3 to DP2
- Security of ATS messages, in terms of Substitution/Information security, is only mandatory at SP4 and above, plus DP3 and above; but when required is set at a common high level, i.e. involving use of recognised encryption algorithms using 128 bit key lengths – which some argue favours IP/GPRS based products.
- Alarm companies are not required to use Availability information, e.g. to fix troublesome installations.
- Where the defined ATS categories do not suit, Clause 5.2 outlines that a 'custom' ATS category can be created using a mix of stated parameters – as shown in various tables contained in Annex D.

  Note. *A pending amendment (A1) to BSEN 50136-1: 2012 proposes removing this Annex*

- The use of WiFi connections between a SPT and a customer's IP router is not specifically recognised, but neither is it precluded. Although the use of WiFi could create additional issues of security/reliability, already several ATS products exist that can be configured to use WiFi to connect the SPT to a router, and thus the ATS network.

5 Selecting an ATS – PD 6669: 2017

Whilst BS EN 50136-1: 2012 is much improved from previous versions, as can be seen there are still some matters of concern to some insurers, and other specifiers, many of which were dealt with in LPS 1277 3.0 but which, so far, have not been incorporated within the latest Euro Stds for ATS.

Representatives of the UK's ATS industry and other interested stakeholders, including RISCAuthority, have therefore helped draft a specific UK ATS standard called 'PD 6669: 2017 – Guidance for the provision of Alarm Transmission Systems (ATS) for Alarm Systems in the UK'. This came into effect from 30 June 2017.

> **Note**. *This document does not replace any content of BS EN 50136-1: 2012 but seeks to supplement or clarify its requirements/options. Compliance with PD 6669 is based on adherence to all relevant parts of BS EN 50136-1: 2012, plus any further requirements of PD 6669, i.e. ATS products claiming compliance with PD 6669 will need to meet both standards.*

Its key features are:

- In a DP ATS, the concept of 'catastrophic failure' (both ATP failing at the same time) is recognised and defined for ATS categories DP1 – DP3*, i.e. if a Primary ATP failure report is due to be made checks have to be made that the Alternative ATP is operational (and operating in step up mode) within 1 minute of the Primary ATP 'reporting time' expiring, and if the Alternative ATP is not found to be working a (catastrophic) total ATS failure is to be reported.

  > ***Note**. At DP4 the timings for ATS failure are sufficiently tight for no there to be no special reporting of catastrophic failure, i.e. it is the same as the ATS failure time shown in BS EN 50136-1: 2012.*

- Two new ATS performance categories are defined; their reporting times being set between the SP3/SP4 and DP2/DP3 categories of BS EN 50136-1: 2012. These new categories are denoted SP3+ and DP2+, respectively.

  > **Note**. *As well as providing an ATS category to fill the, arguably too large, gap that exists between the options outlined in BS EN 50136-1: 2012, these additional options may prove useful where a high performance ATS is being used that is failing to meet its specified Availability, and the issues causing it cannot be resolved. In such cases the SP3+/DP2+ options of PD 6669 could allow an alarm company to use an ATS category with less onerous Availability requirements, but without compromising other aspects of ATS performance as severely as if the next lower category of BS EN 50136-1 was applied.*

- Alarm companies are expected to use ATS providers' Availability information to try and resolve poorly performing installations – and, if they can't be resolved, to notify the customer that their security may compromised.

Some of these features of PD 6669 are expressed in Table B1, contained in Annex B:

	SP1	SP2	SP3	SP3+	SP4	SP5	SP6	DP1	DP2	DP2+	DP3	DP4
Primary ATP Reporting time	32 d	25 h	30 m	10 m	3 m	90 s	20 s	25 h	30 m	10 m	3 m	90 s
Alternative ATP Maximum period when primary operational	Op	Op	Op	Op	Op	Op	Op	50 h	25 h	25 h	25 h	5 h
Alternative ATP Maximum period when primary failed	Op	Op	Op	Op	Op	Op	Op	25 h	30 m	10 m	3 m	90 s
Catestrophic failure	32 d	25 h	30 m	10 m	3 m	90 s	20 s	25 h	31 m	11 m	4 m	3 m
ATS reporting time *	32 d	25 h	30 m	10 m	3 m	90 s	20 s	50 h	60 m	20 m	6 m	3 m

Key

Op = Optional

* Where an ATS includes more than two ATPs the ATS reporting time shall meet the requirements of this table.

Table B.1 – Maximum reporting time based on BS EN 50136-1 and showing additinal DP and SP categories

Other features of PD6669 include:

- Whilst Availability requirements are included for DP2+, they are optional for SP3+
- In a DP ATS, guidance is given for the minimum Availability levels likely to be needed for each path, to help support achievement of the required overall ATS Availability (per BS EN 50136-1)
- Clause 3.1.4. In relation to diverse interfaces (see BSEN 501361- above), a definition of 'diverse network connection' is provided and a revised definition of DP ATS provided using 'diverse network connections' in place of 'diverse technologies'.

  Note. *This appears to give greater credence to use of dual radio ATS.*
- Clause 5.1 Note 1 clarifies that "where the ATS uses two differing communication techniques over the same ATP, this is considered to be a single path, e.g. an ATS which normally uses GPRS but can switch to GSM…"
- Within BSEN 50136-1, 'step up' is now recognised as part of a DP ATS, and it should continue until the Primary ATP is repaired. Recognising the potential for increased polling call costs, plus the need to (ideally) get problem ATS fixed rather than continuing to run on only one path, PD6669 places a minimum period for step up of 120 hours, after which it can reduce or cease. However, if not already actioned after 96 hours the ATS provider must report an ATP fault - which gives an alarm company 24 hrs to try and fix problems before step up reduces/ceases.
- In 'Annex A' guidance is given to alarm companies on good ATS set up/installation practice, including:
  - the location of the SPT
  - use of WiFi connections
  - the need to document certain general issues that might affect ATS reliability in the System Design Proposal (SDP)/As Fitted Document (AFD).

  See Appendix A of this guide for a copy of Annex A of PD6669.
- In 'Annex C' the concept of 'hosted' and 'non-hosted' ATS is recognised, with guidance on secure data centres and ATS connections given for hosted systems.

Note. *Although PD 6669: 2017 is a published British Standards Institution (BSI) document, it was not completed in time to be included as a referenced document in the formal UK scheme for implementing the Euro Stds, i.e. within PD 6662: 2017. As such, it does not currently form part of the compulsory (alarm inspectorates) regime for use of the Euro Stds, and its adoption is therefore (currently) voluntary.*

6 Selecting an ATS – risk assessment

The key concept behind the Euro Stds is to outline a range of (Graded) choices from which alarm companies can choose, based on a formal security risk assessment they are required to make for each customer's premises – ideally also taking account of input from interested stakeholders, e.g. a customer's insurer.

Unfortunately, evidence exists that some alarm companies have a fairly token approach to risk assessment and particularly so as regards choice of ATS; with occasional use of single path products instead of dual path in 'confirmation' systems, and many seemingly routinely using dual path ATS of the same notional 'grade' as the Grade of the underlying alarm system, e.g. 'grade' 2 DP ATS with Grade 2 alarm systems.

Insurers tend to have a more practical approach to risk assessment on the basis that if things can go wrong they probably will, so often feel it prudent to seek the best possible protection, but still having regard to reasonable cost – which has to be borne by their customer.

So, in terms of ATS what can go wrong?

Insurers' experience shows that attacks on ATS most commonly involve:

- Cutting of a telephone line - with criminals waiting on site/nearby to see if a human response is raised (i.e. criminals are checking whether the line is being remotely monitored for failure).
- Smashing of ATS equipment and/or an alarm system's control panel (an example of 'catastrophic failure') immediately after a break-in (i.e. before any signals/alerts are possibly transmitted from site) - with criminals again waiting to see if a human response arrives (i.e. criminals are checking whether a line, or if a dual path system, a line and a radio path, is/are being monitored for failure).

For ATS with lower levels of performance, and especially those that rely upon site equipment to report one path failure over the other (or to initiate higher levels of polling after locally detected loss of one path) the chance of such attacks being successful depends partly on how easy it is for criminals to locate and reach the site ATS/control equipment – and destroy it before any warnings are sent off site.

Vulnerability of such equipment often depends upon whether or not it is located in/next to an area operating as a time delayed alarm entry/exit route (for user unsetting) - which criminals can exploit to reach ATS equipment. Many older systems have this vulnerability, whilst newer or better designed systems tend not to - but as little certainty of practice exists it is best to assume site ATS equipment is likely to be vulnerable.

For good protection against the consequences of external path compromise (e.g. line cutting) and possible internal attacks on site ATS equipment, an ATS needs to have a high degree of active telephone line and radio path monitoring (e.g. via frequent polling). Generally speaking, and given the often minimal cost differences between products of high and lower performance, insurers will tend to specify/prefer ATS with good performance (and ideally catastrophic) failure reporting.

Note. *Jamming of radio based systems is often talked about as being possible, it being legal to buy, but not use, jammers in the UK. However, evidence for this form of attack is slim except perhaps in Northern Ireland.*

7 Conclusion

Over the past 10 years or so nearly all ATS providers selling products for use with I&HAS in the UK have embraced the need for and value of having their ATS products independently certified. However, the standards against which this is done have often contained areas of uncertainty and in the absence of an alternative UK standard LPS 1277 3.0 was felt by some to be the only ATS certification scheme that could be unreservedly recommended. As a result some insurers have sought to only specify LPS 1277 3.0 ATS products for new installations, or at least recommend them to their customers. Others have been reluctant to do so, given the lack of uniform ATS/alarm industry adoption/understanding of the scheme.

In the resultant fractured market, and with uncertainties remaining over the precise performance of some ATS, many insurers have continued to specify ATS by reference to specific brands/products of (investigated/known) performance, rather than rely on a simple generic product category from the relevant Euro Stds.

However, the sheer number of available ATS products, i.e. existing but no longer sold and those currently available (all with many similar variants) - believed to be over 170 at the last RISCAuthority count – makes such a process complicated, inconsistent (and arguably too partial), and also likely to be increasingly untenable as a whole new set of ATS products come onto the market designed to meet the new standards regime. Many stakeholders feel it would be better for all involved if ATS specification could be simply made by reference to clear, unambiguous standards, i.e. a level playing field for all.

The advent of a new (2012) BS EN 50136 (plus updated related parts of that suite) plus a revised (2017) BS EN 50131 system standard document means that more certainty about ATS selection, performance and management now exists than was previously the case; and ATS certification to relevant parts of the latest version of BS EN 50136 is likely to go a long way to addressing the deficiencies of previous versions.

However, for an ATS that comes closest to meeting an informed specifier's requirements for a 'state of the art' ATS, additional performance requirements, accompanied by further independent testing (and, ideally, better installation practice), as per PD 6669: 2017 is highly recommended.

7.1 Implementation

As previously mentioned, individual alarm companies will determine when they start using the new standards called up in PD 6662: 2017, but it can reasonably be expected to become more common through 2018.

With use of PD 6669 not called up in PD 6662: 2017 its proponents sought to have it included in the 2018 revision of the National Police Chiefs' Council's Security System Policy – which would at least make its use obligatory by the regulated alarm company sector in the context of police response I&HAS. However, some last minute objections were raised by some representatives of the alarm company industry which caused NPCC to decide to only include it this year as an advisory standard, it being listed in Appendix S, Annexe A as follows:

PD 6669:2017 Guidance for the Provision of Alarm Transmission Systems (ATS)
(Optional Standard – to be reviewed April 2019)

As can be seen, subject to better industry understanding/agreement, the intention is to review any issues that may arise and then look to make its use mandatory from 2019.

Whilst the adoption of PD 6669: 2017 seems a little uncertain at present, the British Security Industry Association (BSIA) supports it, as do several ATS providers and some larger alarm companies plus the RISCAuthority Security Working Group. The 'objections' raised by part of the alarm industry appear to relate not to the requirements for ATS products but mainly to the stated expectation for alarm companies to try and resolve poor Availability and follow the Annex A fitting advice.

Recognising that there are areas within the document that might cause some problems of application/interpretation, and some revision may be necessary after a trial period, in February 2018 the BSIA launched a 'Stakeholder Group' to trial the standard and take the debate forward – with its first meeting taking place in March. The group is open to all, and currently includes BSIA, some ATS providers, ARC's, alarm companies and representatives of NSI and SSAIB. The RISCAuthority will also be participating.

Notwithstanding the above, it is to be hoped that certification/test bodies* will further develop their schemes for certification to BS EN 50136-1: 2012 to include an option for 'top up' testing to PD 6669: 2017. (it appears that 'testing' to PD 6669 is more likely than certification, as PD 6669 is not a recognised product standard).

***Note**. *BRE, the owners of the LPCB certification scheme, propose to replace their LPS 1277 scheme during 2018 by LPS 1670 – a similar scheme that reflects the requirements of the new 'European Standards ATS regime, plus the UK's new PD 6669: 2017.*

Whilst it is expected that major UK ATS providers will wish to have their products and/or product certifications updated to reflect PD 6669, pending any formal action on the part of the alarm inspectorates and/or NPCC to encourage its use, insurers and other specifiers wishing to use PD 6669 compliant products will need to specifically ask for them.

Undoubtedly, if ATS providers seek it and the certification/test bodies provide it, then products certified to both BS EN 50136: 2012 and PD 6669: 2017 will become available from a number of sources, and thus will be the only ones sold for use by alarm companies – whether or not they, or the inspectorates, wish to fully embrace all aspects of PD 6669, i.e. in terms of its (limited) specific content that affects them.

Industry wide adoption of PD 6669 could greatly improve the reliability of ATS and also ease ATS selection/specification; not least by allowing insurers, and other specifiers, to have sufficient confidence in ATS installation, performance and management to simply rely upon use of any suitably certificated/tested ATS product (meeting a desired performance category) of PD 6669, i.e. irrespective of brand, product or technology – to the benefit of all involved.

By way of summary, some key benefits of PD 6669 include:

- Requirement for Catastrophic failure reporting for most categories of DP ATS.
- The option to use possibly more cost effective, but still reasonably secure, ATS performance categories, i.e. SP3+ and DP2+, which lie between many insurers (default) 'gold' standard of SP4/DP3 and the fairly weak performance of SP3/DP2 - and which could therefore be better suited to some medium and lower risk premises.
- The option of slightly reducing ATS performance, e.g. from DP3 to DP2+, to help combat possible ATS false alerts (e.g. at sites experiencing poor availability that perhaps cannot otherwise be resolved), rather than using the next (much lower) level of BSEN 50136: 2012, e.g. DP2.
- Requirement for systems with poor Availability to be investigated by the alarm company.
- Provision, in one place, of a mix of existing and new good practice fitting/installation advice (Annex A).

> **Note**. *Whatever the eventual use/status of PD 6669 an amendment (A1) to BSEN 50136-1: 2012 is currently in the process of formal adoption and includes some items contained in PD 6669 - the main one of likely interest to insurers being the adoption of 'catastrophic' failure reporting requirements and a requirement for alarm companies to take provided (poor) Availability figures and attempt to rectify them.*

7.2 Action

During the 'dual running' period recognised by PD 6662:2017 (effectively early 2018 to May 2019) of the old and new standards, insurers and other specifiers will have a range of options open to them for specifying ATS (and I&HAS) which will involve use of several possible valid options - noting that which one will be recognised (and thus capable of being actioned) by any particular alarm company will depend upon their level of knowledge and use of the new standards, particularly PD 6669, and the availability of suitable products/equipment. In reality, until we get closer to June 2019, it may be necessary to offer all three choices shown.

> **Note**. *These options relate only to ATS. Specifiers outlining requirements for an alarm system will, in addition, usually also need to make reference to a required Grade of system and, if police response is sought, BS 8243.*

A/ Use existing standards

Ask for an alarm system installed to meet PD 6662: 2010, with use of an ATS of an appropriate type (SP or DP) and having the required (ideally third party certified) performance level, e.g. ATS 5, etc - all as permitted by the minimum Notification Options of Table 10 of BSEN 50131-1: 2006 + A1: 2009.

AND

If requiring an ATS with proven better performance ask for, or at least recommend use of, one with certification to LPS 1277 3.0.

Notes.

1/Option A might (technically) preclude the use of some more recent ATS products, i.e. those designed to meet BSEN 50136-1: 2012.

2/ If referencing LPS 1277, a recommendation should also be made that the alarm company observe the installation guidance contained in its Annex C.

B/ Use of a mix of old and new standards

Ask for an alarm system installed to meet PD 6662: 2010, with use of an ATS of an appropriate type (SP or DP) and having the required (ideally third party certified) performance level, e.g. SP4 or DP3, etc, of BS EN 50136-1: 2012 – but only as an equivalent or better ATS than the minimum Notification Options of Table 10 of BSEN 50131-1: 2006 + A1: 2009

AND

If wanting an ATS with proven better performance ask for, or at least recommend use of, one with certification to PD 6669: 2017.

Notes.

1/ Strictly speaking old and new standards cannot technically be mixed in this way, but new ATS products are inevitably developed to meet the latest specific ATS standards and, in reality, are then used in place of older/discontinued ATS products that might be the only ones formally recognised by an older scheme/system standard. This is what has been progressively happening in UK since BSEN 50136-1: 2012 formally came into effect in 2015, i.e. ATS products designed to meet it have been widely sold and used with older I&HAS plus newer systems designed to meet PD 6662: 2010 (which does not reference the most recent versions of BS EN 50136-1 and BS EN 50131-1).

2/ If referencing PD 6669, a recommendation should also be made that the alarm company observe the installation guidance contained in its Annex A - see Appendix A of this guide for a copy.

C/ Use new standards

Ask for an alarm system installed to meet PD 6662: 2017, with use of an ATS of an appropriate type (SP or DP) having the required (ideally third party certified) performance level, e.g. SP4 or DP3, etc, – all as permitted by the minimum Notification Options of Table 10 of BS EN 50131-1: 2006 + A2: 2017.

AND

If wanting an ATS with proven better performance ask for, or at least recommend use of, one with certification to PD 6669: 2017 or (once available) LPS 1670.

Notes.

1/This option will preclude the use of some older ATS products, i.e. those not designed to meet BSEN 50136-1: 2012.

2/In either case a recommendation should also be made that the alarm company observe the installation guidance contained in the relevant PD 6669 or LPS 1670 Annexes. See Appendix A of this guide for a copy of Annex A of PD 6669.

Whatever options are adopted, insurers and other specifiers should be aware that:

- ***After 1st June 2019 option C/ will be the only valid choice***
- ***In the meantime, if (with options B/ and C/) use is required of an ATS having different performance levels to those shown in Table 10 of BSEN 50131-1: 2006+A2: 2017, i.e. SP3+ or DP2+, reference must be made to PD 6669.***

Appendix A – Extract from PD6669: 2017

Annex A (Informative) Installation guidance for intruder and hold-up alarm application

A.1 General

The housing of the SPT should conform to BS EN 50131-10.

In addition to the requirements of DD CLC/TS 50131-7, the following should apply.

a) The SPT should be located where it is not visible to, or readily accessible by, members of the public and be in a supervised area.

b) Preferably, the SPT and network equipment on site should not be located in an area forming part of an entry/exit route.

c) The SPT and network equipment on site should be located in an area where a full activation (see Note 1) is generated when unauthorized access occurs once the IAS is set.

d) Where parts of a) to c) cannot be achieved, this should be agreed with all interested parties and recorded in the system design proposal and as-fitted Document.

NOTE 1 A full activation means a confirmed alarm for a BS 8243/ DD 243 compliant system or an alarm for other systems.

NOTE 2 SPT and network equipment includes ATP aerials. Where, to achieve adequate performance, these cannot be located as described in a) to d), they can be installed elsewhere (preferably indoors), provided the positioning is considered to be such that it is not readily discoverable or accessible by intruders.

A.2 Installations using Wi-Fi

Where a connection between a SPT and premises router uses Wi-Fi, the alarm company should:

a) ensure that the connection is to the customer's Wi-Fi and not another available network;

b) advise the customer to ensure Wi-Fi access is protected with the customer's password, not the manufacturer's default; and

c) recommend that the SSID (Service Set Identifier) is hidden.

The information referred to in b) and c) should be included in the system design proposal and/ or as-fitted document

The connection between the SPT and the router should comply with BS EN 50136-1.

A.3 Customer (end user) Information

The alarm company should advise the customer, in writing, e.g. as part of a SDP or other quotation document that:

a) modifications to their telephone or data provision (including changes to their local IT network) might prevent or hinder the transmission of alarm information or otherwise cause false alerts which might cause customer inconvenience and/or (where it is provided) result in withdrawal of police response;

b) equipment, e.g. private automatic branch exchange (PABX), routers and network equipment on site, associated with the ATS should be continuously powered. Customers should be advised to consider protecting the power supply against accidental disconnection, e.g. by use of an unswitched fused spur connection, or by having such equipment or its power supply connections located in an area/room to which unauthorized access is restricted; and

c) where an ATS is provided to reflect their insurer's requirements, any subsequent changes/ modifications should be checked with their insurer before implementation.

   This should be included in the system design proposal and/or as-fitted document.

Appendix B – ATS Comparison table

This table provides an approximate comparison of some key performance features of dual path ATS used/most likely to be used in the UK – all in the context of the old and new standards regime. In some areas a direct comparison cannot be made, but the table will give a broad indication of the relative merits of ATS of different performance levels under each of the standards regimes shown.

	Old regime							New regime						
Key standard	**BSEN 50131-1: 2006**			**LPS 1277 3.0**				**BSEN 50131-1 + A2: 2017**			**PD 6669: 2017**			
Table 10 DP ATS Values &	ATS 2/1	ATS 4/3	ATS 5/4	Enhanced ATS 2/1	Enhanced ATS 4/3	Enhanced ATS 4+/3	Enhanced ATS 5/4	DP1	DP2	DP3	DP1	DP2	DP2+	DP3
Notif Options	2C	3C	4C	2C	3C	3C	4C	2C	2F/3C	3E	2C	2F/3C	3C	3E
1st ATP - Fail	25 h	5 h ^	3 m	25 h	5 h	10 m	3 m	25 h	30 m	3 m	25 h	30 m	10 m	3 m
2nd ATP - Fail: On standby	25 h	25 h	5 h	25 h	25 h	25 h	5 h	50 h	50 h	25 h	50 h	50 h	25 h	25 h
2nd ATP - Fail: Stepped up	25h ?	5 h ?^	3 m ?	N/A	5 h	10 m	3 m	25 h	30 m	3 m	25 h	30 m	10 m	3 m
ATS Fail: Catastrophic	N/A	N/A	N/A	25 h 1 m	5 h 1 m	11 m	3. 5 m	N/A	N/A	N/A	25 h	31 m	11 m	4 m
ATS Fail: Sequential	50 h ?	10 h ?^	6 m ?	50 h	10 h	20 m	6 m	50 h	1 h	6 m	50 h	1 h	20 m	6 m
Availability: 7 day	N/A	N/A	N/A	99.3%~	99.5%~	99.8%~	99.8%~	N/A	99%	99.8%	99%	99%	99.8%	99.8%
Substitution Secty	S1	S1	S2	S1	SS	S1	S2	Op	Op	M	Op	Op	Op	M
Information Secty	I1	I2	I3	I1	I2	I2	13	Op	Op	M	Op	Op	Op	M

Notes

Under the 'old regime' heading the information shown for the 1st and 2nd ATP is given using the convention that a dual path ATS is one ATS with two paths, and where 1st ATP = Main ATP and 2nd ATP = Additional ATP

? With the position unclear in the standard, figures shown are those typically found - based on UK ATS providers' usual interpretations of the standard's requirements

^ Recognising that ATS 4/3 is not very demanding, many UK ATS providers supplied/supply products performing better than the related min. requirements of the standard

~ Based on the Availability requirements of BSEN 50136-1: 1998 (not formally adopted by UK) which were expressed as a yearly % rather than 7 day

Substitution/Information Requirements shown are as per codes used in relevant standards: In short S1/I1 = Protected from basic criminal attacks: S2/I2 = protected from technical attacks: I3 = protected by algorithms using random 'keys': M= Use of algorithms based on cryptographic techniques (min 128 bit 'keys')

Appendix C – Future developments

We live in an age of technological innovation, and to an extent standards will therefore always be playing 'catch up' with future developments. As a result, further revisions and amendments to ATS standards can be expected over the next few years, to both cater for technological progress and, currently unforeseen, developing methods of criminal attack. An example of this may be in relation to the increasing use of twin radio dual path ATS or WiFi connections within premises – each of which may present some real/practical problems beyond those currently regarded, by many, as largely theoretical.

Another area likely to affect ATS is that BT consumer, via their 'All IP Transformation Programme', and other telecoms Communication Providers CP), are moving to provide digital only voice telephony services (VoIP)*. This is likely to see 'Fibre to The Premises' (FTTP) become more common and will, ultimately, see the withdrawal of analogue PSTN technology – as used by many existing ATS services.

*The RISCAuthority are preparing a guidance document on this topic

One known effect of the move to VoIP/FTTP is that the 50 volt line voltage provided by telephone exchanges to power customers' phones/telecom devices (aka Customers' Premises Equipment – CPE), and which includes parts of some ATS, will cease to be available and, unless instead provided locally (e.g. from a 50V port on a locally mains powered router), will see many established ATS products cease to work – and thus need replacement, most likely by a product using IP.

If the trend to make much wider use of IP connections (often said to be unreliable overnight) continues (e.g. Internet of Things -IoT) then, aside from any reasons to use dual path ATS in relation to provision of confirmation (i.e. with police response I&HAS), the use of DP ATS will probably need to become the default option for all remotely monitored electronic security systems – but with failure of just one path routinely (temporarily) ignored by ATS provider, ARC or RVC – to avoid undue (false) keyholder call outs.

In such a scenario, only the most resilient and reliable ATS will be likely to fully suit stakeholders' needs for security and convenience, e.g. those that meet the requirements of BS EN 50136: 2012 and PD 6669: 2017 (or an equivalent certification scheme, such as LPS 1670).

Note. *With the use of IP enabled landline communications seemingly becoming the norm, insurers and other specifiers may wish to consider the degree of 'future proofing' that may exist in an ATS product specified today, and make suitable allowances for this*.

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