

Trust targets 100 per cent flushing compliance

A software system that automatically emails hundreds of clinical and non-clinical staff across the Northern Lincolnshire and Goole NHS Foundation Trust's three hospitals requesting confirmation that low-use toilets, showers, and taps have been regularly flushed in line with HTM 04-01 guidance, is reducing the risk of biofilm build-up, and thus of *Legionella* and *Pseudomonas aeruginosa* colonisation, with, on average, a 95-97 per cent flushing compliance. As *HEJ* editor, Jonathan Baillie, discovered from the Trust's Estates & Facilities Information & Compliance manager, Vince Tennison, the system is just one of an arsenal of measures that the Trust's Compliance team is harnessing to keep patients safe, and provide assurance of compliance to the Board and regulators across a range of estates and facilities activities.



The Northern Lincolnshire and Goole NHS Foundation Trust's three hospitals – the Scunthorpe General Hospital, the Diana, Princess of Wales Hospital in Grimsby, and the Goole and District Hospital.

Healthcare estates and facilities managers in hospitals countrywide will know how time consuming and labour-intensive a task their engineers face in ensuring that low-use water outlets are regularly flushed in line with guidance in HTM 04-01: *Safe water in healthcare premises*, the Health & Safety Executive's Approved Code of Practice L8, *Legionnaires' disease. The control of legionella bacteria in water systems*, and HSG 274, *Legionnaires' disease: Technical guidance* document, to reduce the risks of biofilm formation, and thus the chances of *Legionella* and *P. aeruginosa* proliferating in taps, showers, and other water outlets. Not only must low-use water outlets in wards, augmented care areas, and a variety of other clinical and office spaces, be regularly flushed to prevent water stagnating and creating conditions favourable to biofilm formation, but the process must be carefully and meticulously recorded and kept up to date, so that the data can be made

available promptly for inspection by anyone from the Trust's head of Infection Prevention and Control, to visiting Care Quality Commission personnel.

A laborious task

Before the advent of compliance management software systems such as Digital Missives' L8guard, which has modules for verifying flushing compliance as part of a wider strategy to guard against both *Legionella pneumophila* and *P. aeruginosa*, many NHS Estates and Compliance teams had to spend hours each week verifying that low-flush outlets across a potentially sizeable estate had been flushed in line with the frequencies set out in healthcare guidance. This generally meant sifting through hundreds of paper returns each week, manually inputting the data, and then identifying repeated instances of non-compliance. Repeat 'offenders', such as a particular ward, department, or office, would then have to be chased via email or telephone

to discover the reason for their low-flushing compliance, and encouraged to improve it.

A fully automated solution

Digital Missives recognised that Estates teams would benefit from a software system that fully automated the process of obtaining flushing returns from potentially hundreds of different contacts, and would even remind late or non-responders of the need to flush and send in a return, if necessary escalating the matter to more senior staff. On receiving the data, the L8guard software (which Digital Missives launched in October 2010 as a *Legionella* module, and was subsequently followed in April 2013 by a *Pseudomonas* module), obviates the need to sort through and manually input data from hundreds, or even thousands, of paper forms by extracting it from pro-forma emailed returns and collating the information into a managed database. Digital Missives manages all the data offsite, adding new contacts and deleting existing ones when staff move, leave, or assume a new role, while the system can generate a wealth of different reports viewable in digital or paper form. This allows, say, an Estates or Compliance



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Relevance of previous career experience

Vince Tennison is the Trust’s representative for the Premises Assurance Model, and is on the PAM National Steering Group. He said: “We have been working in line with the principles of PAM – which incorporates 46 individual self-assessment questions – for the past four years. This very much links in with my career background. For example, I have considerable experience with self-assessment in the education sector. At Hull College, I worked both as a Curriculum Leader, and subsequently, a Partnership Funding Manager – roles which exposed me to Government and Ofsted quality compliance. While there, I went out into industry, visiting organisations, and consulting on LEAN manufacturing and business improvement techniques. Earlier, I spent 11 years at Armitage Shanks/Ideal Standard, working from the shopfloor upwards, culminating in me becoming its Quality manager. When its Hull site closed down in 2006, I retrained and got my A1 Assessor’s Award, then becoming a Business Improvement Training consultant for Hull College. I worked my way up there from an NVQ Assessor training consultant to a Partnership Funding manager. At the time Hull College was the UK’s fifth largest college, with an Ofsted rating of

‘Outstanding’, and access to considerable funding. Many training organisations UK-wide were accessing this money, and part of my role was to ensure that they were meeting the Skills Funding Agency’s compliance regulations, and looking at their Ofsted credentials and levels of assurance.

“I was subsequently recruited by a railway training company, Intertrain, which had national reach, where I worked for four years as an associate director for Quality & Compliance, before leaving to join the Northern Lincolnshire and Goole NHS Foundation Trust in mid-2018. The rail industry is a highly regulated industry, and I was tasked with really looking at its health and safety, quality of delivery, and the compliance of working within the sector. The business was required to secure the ISO 9001 (2015) quality standard, and OHSAS 18001 health and safety accreditation, as well as the ISO 14001 environmental standard. You can therefore appreciate – from such work – that my experience encompasses elements including health and safety, facilities management, training compliance, and self-assessment – all of which are fundamental to NHS PAM, and to my role here at the Trust.”

manager, or head of IPPC, to generate reports which they can then, for example, present at Water Safety Group meetings, or for inspection by the CQC. Users of both the *Pseudomonas* and *Legionella* L8guard modules pay Digital Missives an annual licence fee, normally based on the number of users.

Help getting the system set up

When I met Vince Tennison, the Estates & Facilities Information & Compliance manager at Northern Lincolnshire and Goole NHS Foundation Trust, at Scunthorpe Hospital, to discuss the Compliance Team’s successful experience with L8guard, he explained that the department head at the time had introduced both the *Legionella* and *Pseudomonas* L8guard modules in 2015, enlisting Digital Missives’ help in getting them set up across all three of the Trust’s hospitals – the Scunthorpe General Hospital, the Diana, Princess of Wales Hospital in Grimsby, and the Goole and District Hospital. He said: “When I joined the Trust in 2018, the Compliance Department – which had been created by the director of Estates & Facilities, Jug Johal – was two years’ old; it is part of the Estates and Facilities Directorate. I report to Bill Parkinson, who is the head of Safety & Statutory Compliance. We have Trust-wide oversight for compliance at all three sites”.

Of the organisation’s adoption of L8guard, he added: “Prior to 2015, the existing paper-based system for recording and analysing low-use outlet flushing had worked reasonably well. However, it was pretty time- and labour-intensive for those undertaking flushing to fill in a paper form, report to the primary or secondary contact on the ward with



Vince Tennison, Estates & Facilities Information & Compliance manager at Northern Lincolnshire and Goole NHS Foundation Trust, and Compliance Admin officer, Emma Drewery.

the data, and for the latter to then send the forms back to the Compliance Team. Then, somebody had to input all the data manually, and, of course, they had to analyse it.”

A worthwhile investment

Recognising that there must be a more efficient, less resource-intensive means of recording low-use water outlet flushing, and then chasing up poor compliers, the Compliance Team heard about L8guard, and contacted Digital Missives to install it. Vince Tennison said: “It has certainly proven itself a worthwhile investment. In the past four years, with L8guard’s use, our hospitals have achieved between 95 and 97 per cent consistent flushing

compliance. However, we must target 100 per cent, as all it takes is one outlet. There are still occasionally outliers with low return rates – primarily where staff migration occurs – but the ability to easily access a wealth of accurate, up-to-date data on which outlets are being flushed compliantly, and which are not, makes chasing up non-compliers, and, if necessary, escalating repeated failures, much more targeted.”

‘Data-rich, but information-poor’

Vince Tennison added: “Of course, with any software system, you can be data-rich, but information-poor; but with L8guard, the opposite applies. Each outlet covered by either flushing compliance software

regime is identified by a name or number; and each ward has a list of all the outlets covered. The relevant person then simply accesses their pro forma via their PC and clicks to confirm which outlets have been flushed. To maximise compliance, the L8guard system automatically emails out the forms, which the designated personnel can quickly fill in on a PC to verify that the low-use outlets they are responsible for have been flushed. They then email back the returns with minimal effort. The returns go direct to L8guard, which manages the entire process, and staff at different levels subsequently receive regular reports providing a comprehensive picture of flushing compliance. We can thus easily identify areas where flushing compliance, or failure to send back returns, is a problem.”

A system of ‘escalation’

At the Northern Lincolnshire and Goole NHS Foundation Trust’s hospitals, the L8guard *Pseudomonas* module emails out flushing reminders to all designated contacts in augmented care areas, including HDU, ITU, and oncology wards, once a day, seven days a week, and the *Legionella* module issues the automated emails three times a week – on a Monday, Wednesday, and Friday. Emails are sent to a set of primary and secondary contacts – useful, for example, if a particular staff member is away for few days. If the system ‘sees’ that a *Legionella* return has not come back within 24 hours, the software automatically informs an ‘escalation contact’, say, a ward manager. If there is no response within 48 hours of the initial email, it will be a missed flush. Vince Tennison said: “The aim is to ensure that even if the primary contact does not respond and email back the return, the secondary or ‘escalation’ contact will, or will notify us why not. The reports generated – which reach me and a number of other users, such as members of our Water Safety Group and Water Safety Sub-Group – are invaluable. Not only can the recipients analyse the data and contact non-compliers directly if they wish to, but the reports are extremely useful in advance of, and during, our monthly Water Safety Sub-Group and bi-monthly Water Safety Group meetings. Staff Trust-wide involved in undertaking the actual flushing have embraced the system well, recognising that it is a major contributor to safeguarding patients against waterborne infection.”

A relevant background

Vince Tennison believes the Trust is perhaps unusual as an acute NHS Trust in having a dedicated Compliance Team within its Directorate. He said: “Quality and compliance are very much in my blood, and throughout my career in various sectors, I have gained a lot of



The L8guard flushing compliance management system is designed to be easy to access and straightforward to use.

experience in how to integrate such considerations in very challenging circumstances. One of the goals of our director, as well as me and my team, is for the Trust’s Estates operations to achieve ISO 9001 accreditation, or, as a minimum, have the foundations of an ISO quality management system.”

He continued: “When I joined the Trust in 2018, I had to learn how L8guard worked. Emma Barrett, a colleague within the Compliance team, greatly helped me

with this. Today, another member of my team, Compliance Admin officer, Emma Drewery, not only extremely efficiently manages the administration and use of L8guard, but also increasingly goes out to see clinical and non-clinical personnel in a range of areas and departments – both to emphasise the importance of the system’s use, and put a human face to our compliance goals. She can also ask particular personnel why flushing return levels in, say, a particular ward,

Head of Compliance’s view

During my meeting with Vince Tennison, I also spoke by telephone to Bill Parkinson, the Trust’s head of Safety & Statutory Compliance, who has been with the Trust since 2002, and has even longer experience of the L8guard compliance management software system’s use. I asked him about the Trust’s introduction of the system, in 2015. He explained: “Our previous paper-based flushing compliance monitoring system was difficult to maintain and keep up to date, and also slow in notifying people if we had a potential issue. We needed a system to address these shortcomings. Before we introduced L8guard, a Compliance Team member generally had to ring the personnel in a particular department or ward if we uncovered a failure to send us back the paper returns. Sometimes this could be a week or more after the event, so where we were missing data, it was difficult to keep on top of it. This all highlighted the need to switch to a new compliance management system.”

He continued: “L8guard was introduced by my predecessor, Malcolm Hoggart, who had had considerable input and help from Digital Missives in getting it set up. One of the things I know we really favoured was the ability to email more than one contact per ward or department, and then for the system to send a further email to an ‘escalation contact’ in the event of no response. We now generally get responses and flushing returns very quickly. We had a fair task to get the lists of emails collated and over to Digital Missives, especially as, at the time, we were migrating over all our staff emails to ones with an ‘nhs.net’ suffix. “However, Digital Missives was extremely supportive throughout, and within three months of beginning collating all the data, we had the system up and running.

“With the company very efficiently managing the system for us, our main administrative task is to ensure we update Digital Missives as contacts change. We were also keen to incorporate some basic awareness information onto the ‘log on’ page to remind users of the necessary actions, with which it also helped us. This information is useful both for new and experienced users. Overall, L8guard has been an extremely worthwhile and cost-effective investment.”

are low. She has been with the Trust for seven years, previously working in administrative roles in Women’s and Children’s and Surgery. She is an excellent ‘people person’.”

A summary of the headline figures

Vince Tennison explained that having received the various reports that the system generates each month, he creates an L8guard ‘Monthly Highlight Report’ – a summary of the headline figures, which is broken down into three distinct data streams – by Trust, by site, and by Department. The report is shared at the Water Safety Sub-Group and Water Safety Group meetings. He also meets informally with the chair of the Water Safety Group once a month to run through the report and highlight particular areas of interest and good practice.

Giving some sense of scale of the number of returns now handled automatically by L8guard, Vince Tennison explained: “Our policy is to undertake 100 per cent flushing of water outlets in augmented care areas across the three hospitals seven days a week. In January this year, there were 14,818 such outlets at our two hospitals in Grimsby and Scunthorpe, for which we sought flushing returns. These are water outlets monitored for *Pseudomonas* in departments including neonatal, ITU, our renal and respiratory units, and oncology wards.”

Emma Drewery said: “Many of these are incredibly busy clinical areas, and although flushing compliance can fluctuate, return rates are now typically between 95 and 97 per cent. *Legionella*-wise, our flushing regime expects outlets to be flushed three times per week, which is above national guidance (which normally advises twice a week). The low-use water outlets we flush to guard against *Legionella* change daily, depending on occupancy of specific rooms or wards. In January, we issued and expected back 2,387 *Legionella* flushing returns, carefully monitoring how many got missed. Again, flushing compliance levels, for showers, washbasins, and toilets overall across the three hospitals for *Legionella* are typically 95-97 per cent.”

As much oversight as needed

Vince Tennison said “Overall, L8guard gives us as much oversight of flushing return compliance as anybody could possibly expect across thousands of outlets, and provides extremely useful reports that we can use as to communicate with leadership on about levels of assurance. We have been seeing stable very high levels of flushing compliance for both *Legionella* and *Pseudomonas* for a sustained period of time. Any significant fluctuations tend to occur at Christmas, or due to staff being

Department/Area	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
Renal	88%	77%	100%	88%	100%	100%	100%	100%	100%	100%	100%	100%
Oncology	88%	100%	75%	88%	100%	100%	100%	100%	88%	100%	100%	100%
Ward 1	11%	100%	75%	100%	88%	100%	100%	88%	100%	100%	100%	100%
Theatres	77%	100%	87%	100%	100%	100%	100%	100%	100%	100%	100%	100%
X-Ray	88%	100%	100%	100%	100%	100%	100%	88%	100%	100%	100%	100%
Pathology	77%	100%	100%	100%	88%	100%	100%	100%	100%	75%	100%	88%
ICU	77%	88%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
ITU	88%	100%	100%	100%	100%	44%	44%	75%	100%	100%	100%	100%
Ward 5	88%	88%	100%	88%	77%	50%	100%	100%	100%	100%	100%	100%
Outpatients	77%	100%	100%	100%	100%	100%	100%	100%	100%	87%	100%	100%
McAfee Ward	77%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Endoscopy	77%	88%	87%	100%	55%	87%	100%	100%	100%	100%	77%	100%
Clinic 1	88%	100%	87%	100%	100%	100%	100%	100%	88%	100%	100%	100%
Clinic 2	77%	66%	87%	88%	77%	100%	100%	100%	100%	87%	100%	100%
Major Trauma	88%	100%	100%	100%	100%	100%	100%	88%	100%	100%	100%	100%
Paediatrics Outpatients	0%	0%	0%	66%	66%	100%	77%	88%	100%	100%	100%	100%
CRU	100%	100%	100%	100%	100%	100%	88%	100%	100%	100%	100%	100%
Pharmacy	55%	77%	87%	100%	88%	87%	100%	50%	88%	100%	100%	100%
Children’s Ward	88%	44%	87%	100%	100%	100%	77%	88%	100%	100%	100%	100%

An L8guard *Legionella* flushing report showing the compliance level across a number of key clinical areas and wards.

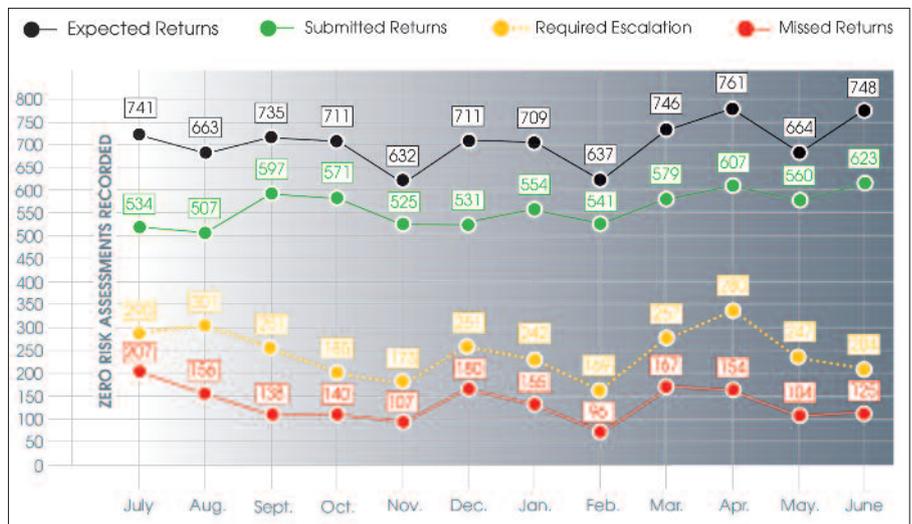
away on holiday. There is an excellent triangulation between us and Estates, which undertakes monthly water sampling to test for both *Legionella* and *Pseudomonas*.”

“In all,” he continued, “I receive 12 different reports at the start of each month, reporting on returns levels over the previous one. When I joined the Compliance Department here in 2018, I worked with the deputy director of Estates and Facilities, Simon Tighe, and Information & Utilities officer, Emma Barrett, to understand the reports, and identify who would best benefit from receiving them. Our reporting structure here includes both a Water Safety Sub-Group, and an overarching Water Safety Group. The former’s role is more operational; it focuses on each Estates ‘area’, and provides reports on other control activities such as chlorination, and silver/copper levels, plus any works going on operationally. The Water Safety Sub-Group’s members are generally operational Estates & Facilities managers and officers. Each Estates officer has

established areas of expertise, and the individuals responsible for water safety attend the Water Safety Sub-Group’s monthly meetings.”

Water Safety Group’s role

Vince Tennison continued: “The more ‘strategic’ level Water Safety Group (which the Sub-Group reports to) meets bi-monthly, and has full ‘cross-representation’ from across the Trust, bringing together clinical and non-clinical expertise. We simply notify Digital Missives which personnel should receive which reports. The key is that the right information gets to the right person. The software also sends escalation emails to department heads on the areas of poor returns compliance. There is a primary, a secondary, and an escalation contact; the latter receives notification of repeated missed returns. Pretty well all the work is done by email, and managed by Digital Missives. Our major input is collating the data generated by L8Guard and trying to turn it into information that people of seniority can use to make informed



A chart showing the rate of flushing returns over a calendar year (July 2014–June 2015).

decisions. As with all information management systems, the data requires constant updating as people move department etc., and there are various ways via which estates and clinical personnel notify us of staff changes. We issue the contact lists for checking by clinical areas every three months. The escalation contacts are usually senior personnel working in the same area as the primary and secondary contacts. We also, here in Compliance, have access to the report library, and can view flushing compliance data whenever we wish. Digital Missives collates all the data, analyses it, sends out the reminders, monitors the response levels, and issues a variety of useful reports, including weekly ones on the 'super-escalations' from the previous week."

Vince Tennison emphasised that the responsibility for the actual flushing is at ward level. He said: "It's all about staff understanding ownership of the process, and who has responsibility for water safety when safeguarding patients. 'Estates' provides the water up to the point of use, and from there the ward staff look after patient safety, not just for water, but equally in a whole range of other areas. We recognise the daily challenges that the clinical teams face, and thus how we interact with them is vitally important. We cannot come across as judgmental, or indeed dismissive." At the Trust, low-use outlet flushing is completed by a range of different personnel, depending on the staffing organisation for that area.

Part of the PAM steering Group

My interviewee explained that he is part of the national Steering Group for the Premises Assurance Model. He said: "We utilise NHS PAM as a driver for underpinning the foundations of the quality management system, ISO 9001, which we are ultimately working towards. I internally audit my team for water, and we also conduct ward floor walks, 2-3 wards at a time, at each site, every three months, where we talk to the Hospital Support Assistants about flushing and L8guard, and introduce ourselves to the individual in charge of the ward."

At the Trust, water hygiene and safety issues - including low-use outlet flushing compliance - receive clinical oversight from deputy Chief Nurse, Dawn Harper, who also chairs the Water Safety Group. Other WSG attendees include Infection Control and senior Estates and Facilities personnel. Vince Tennison explained: "All the WSG members receive all the automated reports, but I also put the full report bank on the Trust's SharePoint system. This is in addition to my monthly summary report, in which I analyse and concisely set out the flushing return compliance levels by hospital, ward and

Many of these are incredibly busy clinical areas, and although flushing compliance can fluctuate, return rates are now typically between 95 and 97 per cent

department, for both *Legionella* and *Pseudomonas*. The recipients of my L8guard Monthly Highlight Report are really busy people, and it gives them the key data they need in an easy-to-read format, complete with trend analysis. The concerted approach we take - combining automated emails, my analysis of the various reports, Emma as the human face of L8guard, the meetings of the Water Sub-Safety Group and Water Safety Group, and Dawn Harper's clinical oversight - gives us a really effective means of monitoring flushing compliance."

Importance of staff's contribution

Vince Tennison explained that efficient and regular flushing of low-use water outlets supplements the Estates team's regular chlorination and silver ion dosing. He added: "The Compliance Team also arranges relevant water safety training for key nurses, and the Nursing Directorate's senior management team. We held the first of a number of planned bespoke onsite courses last December, both for Water Safety Group members and other key personnel, focusing on the management of *Legionella*. We previously always sent people away for training. The idea is to have a more bespoke training course - in this instance delivered by Deputy Estates & Facilities director, Simon Tighe. He feels the onsite approach gives access to training to a wide range of staff, reducing the travel busy people have to undertake, but, even more importantly, the training is tailored to the Trust specifically. We had an excellent attendance, and a receptive group keen to learn. We are now looking at ways for Simon and I to deliver internal training on *Legionella* to some of the ward nurses.

"Digital Missives," he continued, "does a fantastic job in managing the data for us; for instance, when we are made aware of staff changes, we simply let the company know and it makes the changes immediately. My latest report showed that in January this year, 2,263 *Legionella* flushing returns were submitted out of an expected 2,387, showing that there were 124 outlets where no return was received. Although 95% flushing compliance

sounds good, it isn't good enough, and we must strive for 100%. Realistically, this is a difficult target, but nevertheless one we must strive for." Another table in Vince Tennison's latest Monthly Highlight Report that he showed me identified those departments that had demonstrated at least two months of underperforming flushing compliance (below 91%) over a three-month period. Other reports can identify trends over the previous 12 months, so improvements or deteriorations in can be seen for any area.

"Overall," he explained, "we have found L8guard to be a key tool in ensuring high levels of low-use outlet flushing; it gives us the peace of mind that one of the key tasks in minimising the risk of *Legionella* and *Pseudomonas* in our hospitals' water systems has been properly and regularly undertaken. We sample for these microorganisms once a month, and, should we suddenly notice a 'spike' in viable counts, we can look at the flushing data to see if the location correlates with a particular ward, department, or room where flushing return compliance has been low. Overall, L8guard is an excellent, easy-to-use, and well-designed compliance management system, with functions that can be tailored to user preferences."

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About L8guard

Digital Missives explains that L8guard is 'a web-based software system that enables users to fully manage low-use water outlet flushing regimes across their entire estate'. It said: "L8guard greatly reduces the administration overheads of processing low-use water outlet risk assessments, while providing up-to-the minute statistical information and analysis.

"By replacing paper-based systems such as log-books, L8guard provides a proactive instant audit trail, helping to ensure ACOP L8, HTM 04-01, and HSG 274 compliance. Low-use water outlets must be identified and flushed through twice weekly, or even daily in critical care areas, and the process must be continually documented to meet HTM 04-01 and HSG274 compliancy. If no low-use outlets are identified, this must also be recorded. In the event of an HSE or CQC investigation, a complete audit trail is necessary to demonstrate compliance. By working with departmental contacts, the system automatically generates risk assessment forms and tracks responses through to completion, escalating when necessary, and providing a fully closed-loop audit trail."