

Beamex

Calibration White Paper

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Paperless
Calibration
Improves Quality
and Cuts Costs

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Paper is part of our everyday lives – whether in the workplace or at home. Take a minute to look around the room you are in and you’ll notice how many objects are made from paper: books, magazines, printer paper, perhaps even a poster on the wall.

Global consumption of paper has grown 400% in the last 40 years. Today, almost 4 billion trees or 35% of the total trees cut down across the world are used in paper industries on every continent (source: www.ecology.com).

So let’s not add to this already heavy burden on our forests and the environment. As manufacturing companies, our consumption of paper is far higher than it needs to be, especially given that there are technologies, software and electronic devices readily available today which render the use of paper in the workplace unnecessary.

Other than helping to save our planet and reducing the number of trees cut down each year, as businesses, there are other, significant benefits in minimising the use of paper.

Take the calibration of plant instrumentation devices such as temperature sensors, weighing instruments and pressure transducers. Globally, amongst the process manufacturing industries, calibrating instruments is an enormous task that consumes vast amounts of paperwork. Far too many of these companies still use paper-based calibration systems, which means they are missing out on the benefits of moving towards a paperless calibration system.

Traditional Paper-Based Calibration Systems

Typically, a paper-based calibration system involves the use of hand-written documents. Whilst out in the field, a maintenance or service engineer will typically use a pen and paper to record instrument calibration results. On returning to the office, these notes are then tidied up and/or transferred to another paper document, after which they are archived as paper documents.

While using a manual, paper-based system requires little or no investment in new technology or IT systems, it is extremely labour-intensive and means that historical trend analysis of calibration results becomes very difficult. In addition, accessing calibration data quickly is not easy. Paper systems are

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time consuming, they soak up lots of company resources and manual (typing) errors are commonplace. Dual effort and the re-keying of calibration data into multiple databases become significant costs to the business.

These same companies that use paper-based calibration systems are together generating hundreds of thousands (millions?) of paper calibration certificates each year. However, by utilising the latest software-based calibration management systems from companies like Beamex, these organisations can significantly reduce their paper consumption, whilst also improving quality, workflow and making other significant cost savings for the business.

Practical Benefits of Using Less Paper

Aside from the financial benefits of moving towards a paperless calibration system, there are practical reasons why firms should go paperless. Often, in industrial environments, it is not practicable to store or carry lots of paperwork. After all, every square foot of the business has an associated cost.

Furthermore, important paper records could potentially be lost or damaged in an accident or fire. So why would these companies generate and store separate paper copies of important records such as works orders, standard operating procedures (SOPs), blank calibration certificates, etc. when these records can all be combined into a single electronic record?

Improved Workflow

With paper-based systems, paper records that need approval have to be routed to several individuals, which is time-consuming. With paperless systems, workflow improves dramatically. There will be less waiting time, as those individuals who need to sign off records or calibration documents can share or access electronic records simultaneously from a central database. The cost and time associated with printing copies of paper documents is also eliminated, as well as the cost of filing and storing those paper records.

Just as important, electronic records enable easier analysis of data, particularly calibration results. Historical trending becomes easier, faster and more reliable, which again has cost reduction benefits to the business. Calibration intervals can be optimised. For example, those instruments that are performing better than expected may well justify a reduction in their calibration frequency.

When a plant is being audited, calibration software facilitates both the preparation and the audit itself. Locating records and verifying that the system works becomes effortless when compared to traditional paper-based record keeping. Paperless calibration systems improve plant efficiencies because the entire calibration process is now streamlined and automated. Costly production downtime due to unforeseen instrument failures will also be reduced.

Paper records may not always reflect the truth.

Data Integrity

The integrity of paper-based calibration systems cannot be relied upon. Paper records may not always reflect the truth. For example, manual errors such as misreadings can occur, particularly when using weigh scales or other instruments that are open to an individual's own interpretation of the data.

Sometimes users may inappropriately modify the results data due to work pressures or lack of time/resources.

Illegible handwritten notes are also a problem, especially if these paper records need to be typed or transcribed to a computer system or database. Transcription errors such as these can lead to all sorts of problems for a business and can take months to rectify or to identify the rogue data.

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Business Benefits

For those more enlightened companies that use software-based calibration systems, the business benefits are significant. The whole calibration process – from initial recording of calibration data through to historical trend analysis – will take less time, whilst mistakes and manual errors will be virtually eliminated. In turn, this means that operators, engineers and management will have more confidence in the data, particularly when it comes to plant audits. In addition, this greater confidence in calibration data leads to a better understanding and analysis of business performance and KPIs (particularly if the calibration software is integrated with other business IT systems such as a CMMS) leading to improved processes, increased efficiencies and reduced plant downtime.

Commissioning

At plant commissioning times, electronic records simplify the handover of plant and equipment. Although handover by commissioning teams that use paper records is straightforward and of universal format, electronic records are easy to

manipulate and can be re-used in different IT systems. Electronic data also provides an excellent foundation for ongoing plant operation and maintenance, without needing to collect all the plant data again.

How paperless should you go?

Of course, in reality, many companies are neither completely paperless nor rely solely on paper-based systems – the process is sometimes a hybrid of the two. A key part of paperless calibration records is the capture of data at point of work, often in difficult industrial environments that would make the use of portable office computers impractical, and the manual entry of calibration results into un-intelligent calibration forms on portable industrial computers prone to eye-to-hand data mis-reads and repetitive strain induced error. One way to overcome these error prone data capture methods is to use portable documenting calibrators to measure what can be measured and provide intelligent, technician friendly interfaces on industrialised PDA or tablet based hardware when manual data entry cannot be avoided. The un-editable electronic data stored on high performance multifunction calibrators can be uploaded to calibration management software for safe storage and asset management. Companies can go even further than this and use electronic records for works orders, business management systems, data historians, and for control systems. In other words, the calibration data is shared with other business IT systems electronically, resulting in completely paperless, end-to-end workflows.

Suitable Hardware

Rather than rely on engineers in the field accurately keying in calibration results into suitably robust laptops or PDAs, it is better to source the data electronically using documenting calibrators that are specifically designed for this task.

Validation, Training & Education

Paperless systems also need validating in the user's own environment. Here, Beamex provides comprehensive

validation, education and training services for customers.

Education and training for users is critical, as this will help companies to overcome the natural resistance to change amongst the workforce, which may be used to dealing with traditional, paper-based systems.

Case Study

Beamex is helping many organisations to implement paperless calibration management systems, including Pharmaceuticals, Chemicals, Power & Energy, Oil Gas & Petrochemicals companies. Amongst these customers is UK firm Croda Chemicals Europe.

Based in East Yorkshire near Goole, the Croda plant uses pressurised vessels to purify lanolin for healthcare and beauty products. Each vessel needs to be certified at least once every two years in order to demonstrate that the vessel is safe and structurally sound. This includes a functionality check on all of the pressure instrumentation, as well as the sensors that monitor the incoming chemical additives and the outgoing effluent.

Senior Instrument Technician David Wright recalls what it was like to perform all of those calibration operations with paper and pencil during the company's regularly scheduled maintenance shutdowns: "It took us one week to perform the calibrations and a month to put together the necessary paperwork."

Today, Croda uses the CMX calibration management software system from Beamex, which coordinates data collection tasks and archives the results. "It's faster, easier and more accurate than our old paper-based procedures," says Wright. "It's saving us around 80 man-hours per maintenance period and should pay for itself in less than three years."