Calibration WORLD

SPRING 2015

A behind-the-scenes-look at a calibration process change

Implementing a calibration system – how to overcome the common pitfalls

Customer success stories

Silkeborg Varme, Denmark

Salt River Project, US

CEO's Letter

By studying the world's most successful companies, business consultants and writers have for several decades attempted to define what separates the winners from the losers. Hardly a month goes by without the appearance of a new list claiming to identify the key factors to success.

Upon closer review of these lists and the discussions behind them, it becomes clear that many of these consultants and writers are essentially rehashing the same material in different terms. That's because the key success factors for any organisation are directly related to the nature of the organisation and how it operates. What, then, are the typical key factors critical to an organisation's survival and success?

Perhaps the most commonly listed success factors needed by any organisation include people, purpose, processes, resources and customers. And yet success depends not on the mere existence of these factors, but rather on their actual application.

Beamex is celebrating its 40th anniversary this year. That means that the company has not only managed to remain afloat for some time already, but also, as the key financial indicators (organic growth, profit, cash flow, return on capital) from the last ten years in particular illustrate, that it has been exceptionally successful in its business.

While I am not a business consultant per se (at least not yet), my list of the Beamex key survival & success factors would today include: unique strategy implementation, engaged and motivated human resources (employee attitudes driving growth and change), corporate culture and quality relationships with our customers. And, of course, it never hurts to have a bit of good luck every now and then. I believe that these main factors will also remain valid for future success, provided they are continually refined and improved.

My heartfelt thanks to all the Beamex customers, employees, owners, partners and other stakeholders for their part in the company's successful forty years in the calibration business!

Happy reading- and remember that we always appreciate hearing your feedback about this magazine or any other idea you'd like to share!

Raimo Ahola
CEO, Beamex Group

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A behind-the-sce at a calibration pr

It is essential to remember that implementing a fully integrated and automated calibration solution is a process.

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After making the decision to implement a new calibration process, the following step is to outline a system implementation process. It is essential to remember that implementing a fully integrated and automated calibration solution is a process. It simply will not happen overnight, and it needs to be executed in several steps. Below is a review of a few fundamentals to keep in mind:

1. There is a large number of interrelated tasks that need to be carried out in an appropriate sequence. Every step is important and decisions need to be made throughout the process.
2. Utilizing a proven implementation model will generate a quicker process than a new, or an extremely customized solution.
3. The implementation process is usually overseen by a project manager and requires the involvement of several professionals.
4. The biggest problems (e.g. scope creep, budget and schedule overruns) are usually caused by poor planning and inadequate resourcing, rather than the individual steps being particularly difficult.

In short, a system implementation process can be broken down into six defined steps:

Initiation

In this phase, the entire framework for the project is established. A target "go live" launch event is defined in this phase, as well as the purpose and the scope for the new calibration system. This phase also involves appointing the project team, preparing a project plan and establishing certain important rules and principles for the project, such as testing and approval procedures and change management for managing changes in the project requirements. Also, defining the roles and responsibilities of both the vendor and the customer is extremely important, as a calibration process change is never a "one man show". Actually, the majority of the resource requirements typically relate to customer tasks and responsibilities. All this must then be documented in the supply agreement, the project plan, job descriptions and progress reports. To ensure a successful outcome, milestones need to be set and the progress needs to be reviewed constantly. It is important to keep the definition of all deliverables related to each milestone in mind. In this phase, the vendor should act as a consultant, as this role is not just to provide a solution, but to offer support and expert advice from delivery to full functionality.

It is essential to remember that implementing a fully integrated and automated calibration solution is a process.

SIX STEPS OF A SYSTEM IMPLEMENTATION

1 Initiation
- Purpose and scope
- Parties' roles
- Risks and assumptions
- Project team
- Project plan
- Change management
- Testing / acceptance
- Deliverables / milestones
- T & C's

2 Process Blueprinting
- Calibration process re-engineering ("as is / to be")
- Fit/Gap analysis
- Cross-functional requirements:
  - Calibration / maintenance
  - Asset management
  - IT
  - Compliance
  - Quality

3 Specification
- User requirement specification ("URS")
- Functional design specifications ("FDS")
- Configuration specification
- Test specification

4 Execution
- System configuration
- Data migration
- Integration setup
- Verification and validation
- Testing
- SOPs and work instructions

5 Deployment
- Launch event
- Delivery and installation
- Acceptance
- Technical training
- Switch from project organization to operative organization
- "Go live" decision

6 Operation
- Benefits realization
- Maintenance and support

TIMELINE

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The key question in the entire project is the ability to accept and adopt a new calibration process, as it is more or less impossible to introduce a new system and tools and assume that they can be used in accordance with the old process.

Process blueprinting

This is perhaps the most significant phase of implementing a new calibration system, because this is when the existing calibration process is documented and the new target calibration process specified. The key question in the entire project is the ability to accept and adopt a new calibration process, as it is more or less impossible to introduce a new system and tools and assume that they can be used in accordance with the old process. However, if the customer feels that he/she is not capable of adopting the new process, the project can still be cancelled in this phase and he/she will have learned a lot about the existing work procedures and new possibilities. Typically, a significant amount of input from a number of users and cross-functional experts, such as IT, compliance and quality is required, as the calibration process has connections to many different areas. Even though plans have been made and goals set, most likely, there will be some unanticipated functionalities or specifications required. Outlining these processes is important to ensure everyone knows how to respond if such an instance arises.

Specification

The basis for this phase is set in the process blueprint. It is a common mistake to jump straight into the specification phase by skipping the initiation and process blueprinting phases. It is important to be sure that the customer is on the same page with the vendor in terms of technical specifications and functionalities, to ensure both parties are working toward the same desired outcome. It is surprising how many different interpretations a single word can have, so going through the technical specifications in detail is justified to ensure that everyone understands them in the same manner. User requirements, functional design and test specifications are all defined during this phase.

Execution

If the first three phases have been done well, this is the easy part. The plans prepared are ready to be executed, mainly by the vendor. If something was not specified or if requirements have changed or change, it is possible to refer to the change management procedures that were agreed upon with the vendor in the initiation phase, as the change management procedures are usually described in the supply agreement or project plan.

Deployment

The "go live" launch event defined in the initiation phase occurs during deployment. This is when all software, equipment and training is put into the end user's hands and approved by the customer. More than likely, the process and system must be "re-sold" to all stakeholders. Therefore it is advisable to plan a launch for motivating people. Even if many have been involved in different phases of the process, this will guarantee approval and successful implementation.

Operation

The operation phase concludes the implementation of a calibration process change. The system is running and the expected benefits are evident. The new system is used in accordance with the new process that is well-documented with new standard operating procedures and job instructions and everyone is trained to work accordingly. Hopefully, the chosen supplier offers strong customer support if something goes awry.

All in all, implementing an overhaul to a company's calibration process will take time and resources. After all of it is complete, the customer will realize the benefits of the efforts through improved efficiency, accuracy and savings in time and money.

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Implementing a system – how t the common pit

A calibration system implementation is only about 20 to 30% technology, the rest is culture and process. Typically, a calibration system implementation involves many different functions and departments within an organization and takes a long time to complete.

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Implementing a calibration system – how to overcome

Why talk about calibration system implementation? Isn't it enough to focus on comparing equipment and software feature lists? The reason is that a calibration system implementation is only about 20 to 30 % technology, the rest is culture and process. Calibration system implementation is also very time- and resource-consuming – the risk of failure is high. Typically, a calibration system implementation involves many different functions and departments within an organization and takes a long time to complete.

Why implement a new calibration system

An efficient, modern, automated, computer-based calibration system, and related processes, have many benefits. First of all, this kind of system will saves money by reducing the costs of calibrations. The most significant savings are accrued when getting rid of the paper-based calibration system; electronic record keeping is more effective and it's possible to get rid of manual recording of calibration results in the field by using documenting calibrators. Calibrate less, because the system can help to concentrate on the most critical calibrations and avoid unnecessary calibrations.

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Another benefit is the improvement of quality and reliability of the calibration records. Using electric record-keeping and documenting calibrators, the errors common in manual entries can be avoided. This will help to ensure compliancy with quality system and regulatory requirements.

The increased efficiency of the calibration process is also one of the benefits of an automated calibration system.

Why focus on the implementation process instead of product features

Often the components of the calibration system (software and calibrators) are selected and compared based on their features and functions only. However, even the components with the best features will not automatically change the way of working. Studies show that only 20 to 30% of the calibration system implementation is about technology. The biggest part is about the business culture and processes in the company.

The implementation is a very time- and resource-consuming operation, and the risk of failure is therefore high. These facts need to be taken into account when implementing a new system.

Many companies have experience with ERP, accounting and other system implementations, but most often it is the first time the company/people implement a calibration system. This will increase the risk of failure.

Typical failures in IT project implementations include overruns of costs and schedule. Also, the expected benefits are not always obtained. Often, dissatisfaction is caused by the incapability of the system vendor/supplier to support the implementation process with required services and documentation.

Calibration system procurement

Due to the software included in the calibration system, the project is largely IT-driven implementation. This is

Definitions and terminology

Calibration
Comparison of the device under test against a traceable reference standard (calibrator) and documentation of the results.

Calibration process
All the individual steps, activities and work procedures that are taken in order to plan, manage and perform calibrations as well as to document and analyze the results.

Calibration system
The equipment and software that are used in the calibration process for planning, managing, performing and documenting calibrations. Typically they include at least portable calibrators and calibration management software.

Calibration system implementation
The process of defining of how the new calibration system should be built and calibration process re-engineered as well as related customizations, systems integrations, user policies, user training and delivery. Implementation involves several professionals overseen by a project manager. To be successful, implementation utilizes a methodology that contains a sequence of inter-related tasks.

the common pitfalls

especially the case in larger implementations covering multiple sites, which may even be located in multiple countries. Various sites are often used to operate different calibration processes.

In this kind of large implementation, one of the key things is the ability to define and adopt a new uniform calibration process across the multiple sites. The actual calibration tools – software and hardware – are often secondary while the processes are the main priority.

To concentrate on the features, functions and pricing of the tools is just not enough to successfully implement a calibration system.

The calibration system procurement itself is a process. It is not enough to use the traditional procurement for tools, i.e. to send a request for quotations and select the tool based on the quotations. To concentrate on the features, functions and pricing of the tools is just not enough to successfully implement a calibration system. The pricing of the individual tools has very little to do with the total costs of the process. Saving money on the price of the tools may cost many times more in the end.

Early warnings

How can one find out if the implementation is on the verge of failure? One of the first signs is when asking the vendor for a quotation for a new calibration system, the vendor just sends a quotation of the tools/products. That already shows that the vendor does not understand the process of how to implement such a system.

When asking for a quotation for a calibration system, instead of just sending a quotation of the products, the vendor should be interested in asking more about the current calibration system/process. The vendor should be interested in the current challenges and the aims of the process. At an early stage, the vendor should also be able to show that he understands the various steps in the implementation process.

Most common pitfalls and how to avoid them

1. Features – functions – price arms race

It is good to remember that the software that has the longest list of features and functions is not necessary the best. Also, the cheapest software may become the most expensive in the end. It is important to analyze the weaknesses in the current calibration process as well as the goals for the new process. What kind of calibration process does the offered calibration system support? It is important to find the most suitable system and the best vendor as a partner to guide the company through the implementation process.

2. Unclear goal and purpose

First of all, it's essential to remember to specify a clear goal for the new calibration system. Without a target it is very easy to fall straight into the discussion of details and features. This causes a high risk for the failure of the process.

3. Modelling an old legacy system into a new system

Sometimes there is a tendency to use the existing, old, paper-based legacy calibration process and force the new computer-based system to conform to the old one. This approach most often results in failure. When the technology and tools are updated, the calibration process should be updated, too. Also, this approach most often does not utilize the benefits and possibilities of the modern automated calibration system.

4. Failing to gain early user and stakeholder adoption

The users and stakeholders must be involved at an early stage and remain throughout the whole implementation process. The bigger the process changes are, the more important to involve the users. The stakeholders include, for example, calibration process owners, IT, compliance and quality. In a multi-site implementation, it is important to include stakeholders from all of the sites.

5. The "Big Bang" implementation

For large, multi-site implementations, the "Big Bang" implementation style has proven unsuccessful and will more often result in failure. Instead, the successful calibration process implementation projects have been gradual roll-outs of the sites instead of one big launch. It is recommended to have a Proof-of-Concept approach where the solution is successfully implemented on one site before the roll-out to other sites starts.

6. Under-resourcing and lack of project organization

It is good to remember that a calibration system implementation is a joint-effort of the customer and the vendor. Often, three quarters of the resource requirements are the customer's responsibility and one quarter the vendor's. As regards the customer, there must always be a well-defined project organization with a dedicated project manager. As mentioned earlier, other resources typically needed are application and process experts, IT resources. Legal council is needed in the contract phase.

SUMMARY

Finally, to summarize some of the key issues:

- System change also means a process change and a key success factor is the ability to define and adopt a new calibration process.
- Focus on defining the goals as well as on the calibration process modeling ("as is/to be"), instead of jumping straight to feature and function lists.
- Understand who the relevant stakeholders are and involve them and the users at an early stage in the process.
- The best way to implement multi-site rollouts is the Proof-of-Concept model.
- System implementation consumes a lot of resources: understand what is required, allocate necessary resources and appoint a project management team.
- A strong executive sponsor is important especially, in multi-site roll-outs and in process change situations

When to calibrate in a work

In today's process industry, the field instruments are often calibrated out in the field. To do so, portable calibration equipment is used. Field calibration is often the best solution, but there are still various reasons why it is sometimes more convenient and effective to do calibration in a workshop. Selecting between field calibration and workshop calibration is not a black-and-white situation. These two methods are not exclusive alternatives; instead, they complement each other.

Beamex has previously presented the arguments for doing calibration out in the field, but this paper will discuss some of the most common reasons for establishing a workshop and doing the calibrations, or some of them, in the workshop with dedicated workshop calibration equipment.

Commissioning

One of the most common reasons to calibrate in a workshop is during the commissioning of a new plant, or some new parts of the plant. During the commissioning, the field equipment is not yet installed as the installation of the process equipment is not completed. The process equipment has typically already been purchased and is in storage in large quantities, waiting for installation. At that point it is very efficient to calibrate all the process equipment in the workshop before it is taken out into the field and installed. It is often faster and easier to calibrate all transmitters in the workshop prior to installation, than to calibrate them in the field after installation. Also, this saves time as the transmitters can already be calibrated before they are installed. After the transmitters are installed, there is no need to reserve any time for calibration, which is a plus because schedules are typically tight.

When installing fieldbus, other aspects also need to be taken into account. If the plan is to calibrate fieldbus transmitters and loops in the field by reading the control system readout, one needs to wait until the fieldbus and the process control system are up and running. If the equipment in the workshop is capable of calibrating fieldbus instruments, the fieldbus process instruments can be calibrated in the workshop before they are installed in the field.

Total uncertainty of the calibration

The accuracy of the field instrumentation has been getting better and better during recent years, and this sets more requirements for the calibration equipment and also for all of the calibration processes. When doing the calibration in the field, the most significant aspects of the total uncertainty often do not come from the calibration equipment but from the calibration processes and the human factors. These are more critical with some quantities than with others.

The situation changes when the calibrations are done in the workshop with equipment and conditions dedicated for calibration work. In the calibration workshop, the calibration equipment does not have to be portable,

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but can be workshop equipment, which often has better performance than portable equipment. Also, the environmental conditions in the workshop can be controlled, so calibrations are always performed in similar controlled conditions. And finally, the operating procedures in a workshop can be more easily written so that the calibrations are performed in a more consistent way than when done out in the field.

Therefore, doing the calibration work in the workshop can result in a more accurate calibration with less total uncertainty.

Primary standards in a workshop

As mentioned in the beginning, workshop calibration and field calibration complement each other. There may be higher-accuracy, non-portable calibration equipment in the workshop as the primary reference calibration equipment. With these workshop primary standards, the portable field calibrators— which are used out in the field and of which there is often a larger number— can be calibrated. This will save money and time as the calibration equipment doesn't need to be sent out for periodical recalibrations. Most of the recalibration can be done by oneself and only the primary standards will need to be sent out for recalibration.

Spare device calibration / rotating spares

In some cases it is more convenient to calibrate a spare device and then replace that into the process. That is especially the case when the calibration is difficult to do in the field, or the calibration takes a very long time to perform. Of course this is also the case when the device has to be sent out to a third party calibration laboratory for calibration. In case the spare device calibration is performed in-house, it is most effective to perform the calibration in a workshop that has a suitable setup always ready for use. The spare device may also be installed in the process only for the time it takes to calibrate the original instrument.

Safety

A professional calibration and service/maintenance bench in a workshop can be equipped with proper safety facilities. This includes items such as: isolation transformer, fault current protection, emergency switch, thermal overload protection, ESD protection, just to mention some. The same kind of safety mechanisms cannot be easily arranged for work performed out in the field.

Accreditation and quality system

In some cases it is necessary or beneficial to apply for an accreditation for the in-house calibration service performed. It is easier to get an accreditation for the calibration work performed in a dedicated workshop than it is for field

calibration. Also, the uncertainty of the calibration can be lessened when it is done in the workshop. Even if an accreditation is not necessary, it is easier to build a quality system for calibration work done in the workshop.

Field conditions vs. workshop conditions

The field conditions may sometimes be challenging to work in.

Often the field is a hazardous area that sets requirements for the calibration equipment to be used, and not all calibration equipment is suitable for hazardous areas. For example, a temperature dry block cannot be used in hazardous areas, but it is still needed for temperature sensor calibration.

Often, instead of carrying several items of calibration equipment out to the field, it is easier to take the small device to be calibrated to the workshop, where all calibration equipment is ready for use.

The environmental conditions out in the field can be challenging. Going into the field may require use of protective gear and may also require a dedicated training to be completed.

There are typically more mechanical maintenance personnel on the work site who can take the device to be calibrated to the workshop, where the calibration specialists can concentrate on the calibration work.

Efficiency, ergonomics, ease of use

When doing the calibration in a workshop, the work can be arranged to be much easier and much more ergonomic than the work performed out in the field. Some of these considerations include:

- All equipment is always in place and ready to be used. All connections can be readily made and ready for use.
- Panel-mounted, mains-operated equipment never has empty batteries that need to be charged before work.
- Equipment never gets lost; it is always where it should be.
- All the equipment is optimally located for an ergonomic work space. The height of the bench tables can be motor controlled so it is easy to adjust ergonomic height for any work.
- Panel-mounted automatic or manual pressure generation modules are ready for use, so there is no need to use manual pressure hand pumps.
- The workshop offers more convenient work environment for the workers. The field conditions may sometimes be very harsh to work in.

In addition to the above-listed arguments for doing the work in a workshop, there is also some calibration and maintenance work that cannot be performed out in the field. A dedicated workshop with adequate equipment in place makes the work easy and effective.

Workshop calibration versus field calibration, summary comparison

There are also many reasons to perform the calibration out in the field. Some of the main arguments for calibration in the field are listed below, as well as a simple comparison for the arguments for both scenarios: workshop and field calibration.

In practice, workshop calibration and field calibration are not things that one chooses between. In most cases, depending on the case, both are used for effective results.

Below, some of the most common arguments for doing calibration in the field are presented:

- Enables calibration of the whole measurement loop in one go, from the beginning to the end, i.e. from the process sensor to the control system reading.
- The calibration is performed in actual process conditions.
- Eliminates the need for removal and re-installation of the instrument to be calibrated.
- If the easy access for calibration has been taken into account in the installation of the process instrument, the calibration can be done quickly and easily.
- Modern portable documenting calibrators help to make the field calibration very effective.

And to summarize, a condensed list of the arguments for workshop calibration explained in more detail earlier in this paper:

- Performing calibration in the workshop during commissioning phase.
- Pursuit of better accuracy / less uncertainty.
- Use of primary standards in the workshop to calibrate the portable working standards in house.
- Spare device / rotating spares calibration in workshop.
- Safety issues can be more easily taken care of in workshop.
- Accreditation for the calibration workshop.
- Efficiency, ergonomics, ease and many other similar practical reasons.

New possibilities with Beamex workshop

The Beamex MCS200 Workshop offers a controlled environment enabling very accurate calibration and ergonomic ready-to-use equipment. Beamex has recently launched the product, MC6 Workstation, an advanced panel mounted documenting calibrator and communicator. MC6 Workstation offers calibration capabilities for pressure, temperature and various electrical signals. Full fieldbus communication for HART, FOUNDATION Fieldbus and Profibus PA instruments is available. MC6 Workstation communicates with pressure controllers and temperature blocks, enabling fully automatic calibration.

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Silkeborg Varme, Denmark

Insourced calibration brings many advantages

Silkeborg Varme has decided to carry out its own calibrations of critical test points in the safety system at its local combined heat and power plant. This investment has paid off within a year.

There are approximately 35 critical test points at the Silkeborg CHP Plant, each with three sensors, making up the fundamental safety system which is required to undergo an annual calibration check. The calibration process was previously carried out by an external calibration company, but this is now done by the plant itself using Beamex equipment supplied by Tech.

"Managing the calibrations ourselves has had several advantages on a daily level, not the least of these being an increase in flexibility as the calibrations can be done when it is most convenient. Moreover, it has resulted in improved safety levels and more possibilities for integration with our own systems. Before, the calibration of the safety system took place as part of the annual review but now we can do as and when it fits into our daily plans", says Anders Ole Jensen, Engineer and Instrument Technician at the Silkeborg CHP Plant, which is part of Silkeborg Forsyning.

The plant produces up to 108 MW electricity and 80 MW of heat from tw o boilers with GE LM6000 gas turbines.

35 critical test points

Anders Ole Jensen is notified by the Beamex software on a day-to-day basis about when calibrations need to be performed. He then goes round to the test points needing pressure and temperature calibrations and connects

"Some calibrations take a few hours, but as the equipment itself is able to carry out the process, the person operating it is able to leave and return when the calibration is complete".

the calibrator – a Beamex MC6 – physically to the test point, for example a pressure or temperature transmitter.

"First of all, all the test points you want to calibrate need to be entered into the Beamex system, so you know the values that need to be maintained and the calibration times. Once this information is in the system, the test points are colour-coded, revealing whether the calibration has taken place as planned, is soon due to take place, or whether the scheduled time has passed. In this way you always have an overview of the situation and can prioritise the calibration tasks on a day-to-day basis. I normally combine several calibration tasks and carry them out in one go", says Anders Ole Jensen.

An example of a critical test point is a differential pressure transmitter which measures evaporator pressure in the boiler and is an indication of the water level, which can in turn affect a heating surface which may not be able to cool down sufficiently. Anders Ole Jensen is now responsible for carrying out the calibration of all the critical pressure and temperature measurements in the safety system, covering approximately 35 test points, each containing three sensors – in total approximately 110 independent calibrations.

'The 35 critical test points comprise the safety system, which turns off the boiler if it detects any values falling outside the set range. There are three sensors for each test point. If everything is working correctly, all three sensors will show the same values. If one sensor deviates from the others, it activates the alarm. If two sensors deviate, the boilers automatically shut down. This is why it's very important that these sensors are calibrated according to the demands of the safety system', he explains.

Automated calibration

Using a hand pump, Anders Ole Jensen tests whether a pressure transmitter is displaying the correct values.

"The upper and lower limits of the calibration range typically allow fluctuation of a few per cent, and this is displayed graphically on the calibrator as a dot that moves up and down and must remain within a specific tolerance range which is represented by blocks on the screen", he explains.

Some calibrations take a few hours, but as the equipment itself is able to carry out the process, the person operating it is able to leave and return when the calibration is complete, for example in the case of certain temperature measurements.

"No time is wasted with these kinds of calibrations, as you can get on with other tasks while the calibration is being performed", says Anders Ole Jensen.

The Beamex equipment has also helped him locate some setup faults in a number of transmitters that were overlooked by the external calibration experts.

"There were errors in the settings of six sensors in the critical system. External suppliers lack the understanding of the bigger picture that we strive for. In this way, the Beamex equipment has given us a higher level of safety", says Anders Ole Jensen.

"With the Beamex system, we now have all the calibration data stored digitally. Before this was stored on an external server. But now they are more concretely 'our data' and can in the long term be even further integrated into our overall maintenance system if we decide to expand our software solution".

1 year payback

In addition to the test points in the plant's safety system, there are approximately 500 test points that need to be calibrated at least every four years.

"With the Beamex solution, we have complete flexibility, so we can perform many calibrations in between other daily tasks. This flexibility is important in a busy workplace where more urgent tasks often arise and need to be prioritised", says Anders Ole Jensen.

The Beamex system is also able to print out a certificate as evidence that the calibration has been performed and stating which values have been registered.

"With the Beamex system, we now have all the calibration data stored digitally. Before this was stored on an external server. But now they are more concretely 'our data' and can in the long term be even further integrated into our overall maintenance system if we decide to expand our software solution", says Anders Ole Jensen.

The cost of calibration has previously been approximately 1,000 DKK per sensor. The need for calibrations of sensors at the plant means that the investment in the Beamex solution had paid for itself within about one year, if you do not include Anders Ole Jensen's working hours.

"I've been able to teach myself to use the Beamex system without any special training. Tech has shown me the basic functions, but we have been able to handle most of it ourselves, and I would imagine that anyone with a little technical knowledge could use the equipment without much trouble. The most time-consuming thing has been putting all the test points into a database", says Anders Ole Jensen.

Used on all major plants

In Denmark, Beamex is available only through Tech, who became the agent for the brand three years ago.

"We have just reached agreements with the last remaining major power plants that not yet have the Beamex

calibration solution. All major Danish power plants now use Beamex solutions, and our next move will be to extend the dialogue with the many medium-size and smaller plants. The Silkeborg CHP Plant exemplifies the advantages of a power plant insourcing its calibrations, in terms of the flexibility it allows and the way it enables the plant to perform all the calibrations it wishes – for example also in relation to alarm faults – without incurring extra costs", says Christian Schrøder, Beamex expert at Tech.

Schrøder lists a number of aspects of the Beamex solution that optimise the process of calibrating the equipment used at power plants, other industrial units and refineries.

"Compared to a paper-based procedure, which we still see in some places, the calibration itself, the logging, documentation and integration with the overall maintenance system are all enhanced. The Beamex solution can be integrated with for example SAP and Sertica systems, so the maintenance program and calibration procedures can be completely merged. This way, planning and documentation of calibration procedures is optimised", Says Christian Schrøder.

Fewer errors in the digital process

Transitioning from a manual to a digital calibration process comes with a list of benefits.

"Working with Beamex greatly reduces the risk of errors that can occur in a manual process that involves first noting the calibration data on paper and then transferring this data into an Excel sheet or the like. There is a twofold risk of entering the wrong data as the values are jotted down by hand and then entered again electronically. With Beamex the transfer of data happens automatically during the actual calibration process, eliminating potential sources of error', says Christian Schrøder.

He also points out that performing your own calibrations allows for greater flexibility in day-to-day planning of procedures, and that calibrations do not all have to wait until the annual review. It also provides a much greater level of transparency when it comes to the status of completed and upcoming calibrations and better data quality in general for physical processes, and you have a great tool to enhance overall quality assurance of processes and safety.

SOLUTION

Description

- Beamex MC6 advanced field calibrator and communicator
- CMX calibration management software

Main benefits

- Increase in flexibility
- Improved safety
- Extended possibilities for integration with own ERP
- Digitally stored calibration data

Calibration companies general charge per test point, but there is no integration with the plant's own maintenance system or a SRO or CTS system.

"External calibration companies simply perform the calibrations and hand over some form of documentation. There's none of the daily synthesis of calibration processes and one's own maintenance and security system that you get when you're in charge of the process yourself. If you want to reduce your downtime and generally think in terms of cost of ownership, taking control of calibration competencies can only be an advantage for your business. It's not every day that one's clients get in touch and just spontaneously express their enthusiasm for a solution, but they do with Beamex, and that must mean that this technology really does enhance their operation and safety levels', says Christian Schrøder.

BY JOEL GOODSTEIN
PHOTOGRAPHY: LARS MØLLER

Salt River Project, US

How one of the largest US power generation providers transformed their

For more than a century, Salt River Project (SRP) has produced power and delivered water to meet the needs of its customers in the greater Phoenix metropolitan area. Today, as one of the nation's largest public power utilities, SRP provides reliable electricity and water to more than 1 million customers and employs around 4,500 people. In order to produce power, including generation, transmission and distribution, to this 2,900 square mile service area, SRP uses a combination of hydro, gas turbine, coal fired, nuclear, solar, geothermal and wind generation. Furthermore, SRP is the largest water supplier in the Phoenix metropolitan area, responsible for water transmission and distribution for a 375 square mile service area while managing a 13,000 square mile watershed. This water production, transmission and distribution includes an extensive system of reservoirs, wells, canals and irrigation laterals.

SRP's calibration history

Jody Damron, a Business Analyst at SRP's corporate headquarters in Tempe, Arizona, has been serving the company for more than 36 years. In 1986, he first began working as instrument calibration technician at the Navajo Generating Station (NGS), a 3-unit, 2,400 megawatt, super critical generating station that went live with the first unit in 1974. The calibration documentation process consisted of a hard copy, index card, paper process. At the time, technicians would take paper cards out into the field and record their findings when they returned.

They soon encountered several issues, including lost data, no data security, no reporting and difficulty creating an audit trail. Jody recalls when a state auditor visited the plant and the cards were misplaced. Jody was responsible for explaining to the state inspector why they didn't have cards readily available. As Jody explains, "it's a very discomforting place to be when you're right in the middle of an audit." However, at the time, NGS did not have the technology to help with this process.

By the early 1990s, Microsoft Excel had been released and Jody was the lead to get all of the information from their calibration cards into an Excel file. This was a step in the right direction, as it provided some data security. By the late 1990s, a new distributed control system (DCS) was deployed at NGS and plant personnel were able to document all of the instrument data for the control system, which was data that never existed before. Later on, NGS decided to improve the database by converting to a Microsoft Access database. The Access database not only included calibration information, but all DCS instrument information as well. As one can imagine, this was a big undertaking and

calibration program

it was the first time IT had to be involved in the process.

The IT team took the time to learn about the business objectives and processes, which was a vital step. Jody also gained insight to how IT operated, interpreted information and viewed their objectives. Moreover, this effort resulted in Jody and the IT business analyst writing an ISA technical report titled, TR77.70.01 Tracking and Reporting of Instrument and Control Data. Overall, this phase brought more notable improvements to the process, including secure data and calibration reporting, which allowed easier compliance to state audit reports, links to drawings, and documented DCS points. But it was still an inefficient and difficult process that was costly and required continuous oversight.

The IT team took the time to learn about the business objectives and processes, which was a vital step.

Small steps for a big evolution

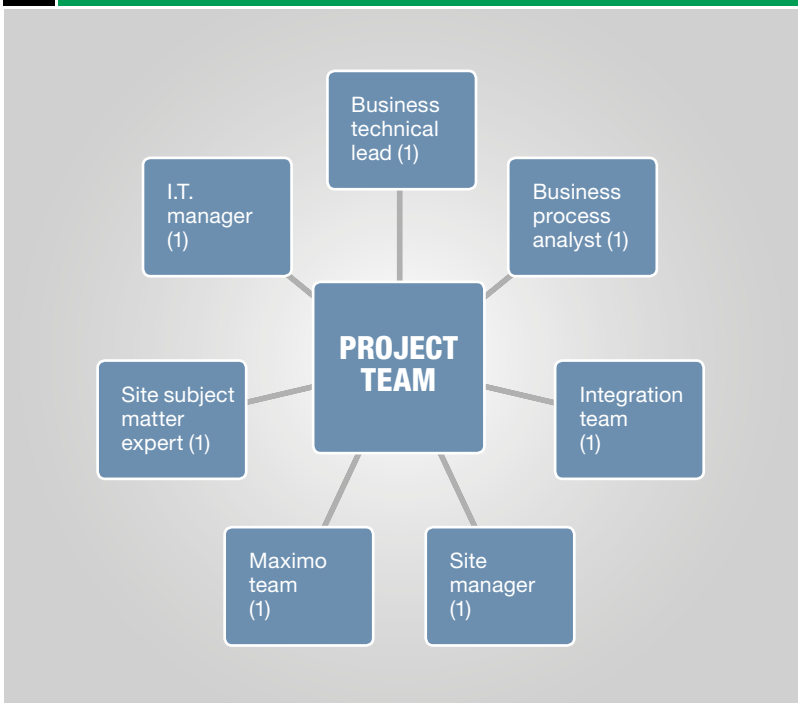
In 2005, Jody was a member of an International Society of Automation (ISA) Executive Committee. While attending an ISA conference, Jody was introduced to Beamex's calibration management software, CMX, during a technical "how to" presentation. He recognized the importance of the increased functionality that calibration software offered over and beyond the current set up.

By this time, Jody had become the instrument supervisor. He decided to take the information back to the site and ask his technicians to review it. He wanted them to help him make such an important decision. They too saw the value, and especially liked the user-friendliness along with the ability to capture more information than they could with Access. Together, they decided to begin using the standalone Beamex calibration management software.

Shortly thereafter, in 2008, there was a corporate initiative to remove standalone software applications. Jody, IT and a Maximo contractor were tasked with replicating all of the Access application functions along with instrument and control data into the corporate work management system, Maximo. It was a difficult project, but the team was able to duplicate most of the functionality they used in Access.

Major accomplishments included more secure data, improved calibration reporting capabilities, less stressful state audit reports, links to drawings, documented DCS points, asset data

FIGURE 1. PROJECT TEAM



comparison, a better governance process, and more detailed instrument meter data. However, there were still inefficiencies, costs were high and significant manual oversight was required.

In 2012, Jody became the generation Business Unit Representative with the responsibilities of leading the generation team and interfacing with IT to implement Maximo and SAP. This project partnered the instrument shop's valuable experience with the IT developers to meet business requirements. Maximo was upgraded from version 5.2 to 7.5, which included a new "built-in" calibration module. The technicians tried using the Maximo calibration system, but they pushed for CMX to be integrated into Maximo because they needed a calibration software that offered more comprehensive features.

Determining the needs of the entire business

By then, Jody had progressed to Business Analyst and the job implementing a calibration process change landed on his desk. He was tasked to give a recommendation on whether or not CMX could integrate into Maximo 7.5, as it needed to function to meet the business requirements. Jody knew that he could not make this decision without some thorough investigation, and he could not make it alone.

Jody began by researching IT integration projects. He was soon amazed to discover the mind boggling number of failed projects, costing companies up into the trillions of dollars. He read about major failures where no progress was made, even situations in which companies were forced to go back to the original way after failed attempts. He declared, right then and there that, "failure is not an option."

Through a preliminary analysis, he concluded that this integration project would require a substantial amount of planning and input from a team of internal departmental experts to ensure that it functioned appropriately for all parties involved. He also knew the external parties, or vendors, would be just as vital to their success.

It was important that he put together a quality team (Fig. 1) that he trusted, because he knew he had to rely on everyone's input and expertise. During this process, he learned important lessons about building a successful team. Jody soon discovered how each party tended to speak different technical languages as well as have different goals and ideology. He determined that communication was going to be the key to success. Jody explains, "the business will say they need an apple cut in 6 pieces and the IT side will hear cut a watermelon in half. Technical, cultural and language communication barriers are real challenges that needed full attention."

He knew they would run into many implementation roadblocks if the team did not work together during the entire process. The team stayed focused on the detailed requirements and met often to review the business expectations.

Responsibilities of vendors and customer

As important as it is for the entire project team to understand everyone's roles and responsibilities to ensure efforts weren't duplicated or missed altogether, it was also essential to define the roles of the vendors and establish clear operation guidelines. The following chart (Fig. 2) defines responsibilities along with brief descriptions for some of the sector's key duties:

FIGURE 2. PROJECT TEAM ROLES AND RESPONSIBILITIES

- **Business:** Data integrity is an important and an ongoing process. For SRP, it has never stopped since it first began in 1974. It is a time consuming, but important process – one which can go south in a very short period of time if it is not continually monitored. SRP put a lot of man hours into ensuring clean data.
- **CMX:** SRP relied on Beamex's expertise. Beamex acted as consultants and were quick to communicate how the integration could work most efficiently and made no empty promises.
- **Maximo:** The Maximo team worked hand in hand with SRP technicians to meet business expectations and functionality requirements.
- **Integration:** It was imperative to make sure the right data was transferred back and forth between systems in the correct manner.

After analyzing all of these factors and gathering information from the project team, risks had to be considered so that Jody could be 100% confident that the integration would be successful. After all, failure was not an option.

How it works today

Upon completion of in-depth analysis by the team, Jody determined that the integration could be completed to meet both the business and IT needs. As Jody eloquently puts it, "it's extremely simple, if you think of how complicated it could be."

These are the basic rules used to form SRP's system:

Communication was going to be the key to success. "Technical, cultural and language communication barriers are real challenges that needed full attention", explains Jody.

(1) CMX is the calibration system of record that stores the detailed calibration information.
(2) Maximo tracks all plant assets and is the master of scheduling.
(3) As for calibration, the only information Maximo needs is if an instrument passed or failed during the calibration event.
(4) In Maximo, there are two types of instrument assets. The first type are regular instrument assets that are never calibrated, for example an orifice plate. Secondly, there are calibrate-able assets, for example a transmitter.
(5) For a Maximo asset to be transferred into CMX, the asset has to be defined as a calibrate-able asset. Out of 28,000 instruments, there are 7,700 assets that require calibration and meet the calibrate-able asset criteria.
(6) If a Maximo work order is written or automatically generated by the preventive maintenance application for a calibrate-able asset, it automatically flows into CMX. This is critical because the rules create a built-in method of security that does not allow "garbage" data to be transferred

SOLUTION

Description

- CMX calibration management software
- Beamex Business Bridge
- Beamex professional services
- Beamex MC6 advanced field calibrator and communicator
- Beamex MC5 multifunction calibrator
- Beamex External pressure modules
- Beamex PGM & PGV pump kits
- Beamex PGXH hydraulic hand pumps

Main benefits

- System oversight has been minimized.
- Audits are easy to perform and are less stressful.
- Defined calibration procedures provide a corporate "best practices" approach to calibration.
- Better decision making because of accurate data.

back and forth. This ensures good data integrity for both software platforms. If a work order is not for a calibrate-able asset, it does not go to CMX.

(7) Work orders are generated by a planner. Technicians will paperlessly pick them up and calibrate them. This process allows field personnel to work only within CMX, and they do not deal with work orders in Maximo, saving them time, money and frustration.

For example, during a typical unit overhaul, many of the site's 7,700 calibrate-able instrument assets need to be tested. Work orders are planned, put into progress, the information is automatically transferred to CMX and the technician is alerted by the planner via email. The technician can then download the asset test information to an MC6 advanced field calibrator and perform the necessary work. Since the MC6 is a multifunction, documenting calibrator, the entire calibration process is automated because the results are stored in the calibrator's memory. When the technician returns to the shop, they upload results into CMX. When a calibration test passes, an automatic notification is sent back into Maximo that closes the work order and documents who performed the work and when it was done. A failure requires the initiation of a follow up work order.

Project review

Throughout this process, Jody notes some key factors he recommends to keep in mind when implementing a calibration process change:

- Do not compromise data integrity.
- Build a solid team.
- Set realistic timelines.
- Set expectations and interpretation guidelines.
- Document the business process.
- Build a governance process.
- Support the new process.

Summary and the results

Salt River Project's calibration processes have evolved tremendously over the past 40 years. As new technology solutions were developed, leaders, such as Jody, demonstrated key insights to embrace the advancements while balancing the necessary changes to create tailored work processes for SRP's business needs. SRP has not only benefited from investing in quality solutions, but from doing their due diligence to carefully plan out the implementation of new processes. Close attention to detail and building a trusted, quality project team (both internally and from their vendors) were crucial factors to SRP's many successes. As a result, as Jody explains, "With this software integration project, we were able to realize a significant return on investment during the first unit overhaul. It's unusual, since ROI on software projects is usually nonexistent at first."

The most significant impact overall is that Salt River Project has been able to save about 30 minutes per calibration using an automated approach. This equates up to 1,000 man-hours in the previously cited unit overhaul example. Further savings are anticipated as history analysis will confirm that extended calibration intervals are recommended. It is important to note that SRP's work order history for calibration is 100% automated and technicians never work in Maximo. Other major benefits of the automated calibration system include:

- System oversight has been minimized.
- Audits are easy to perform and are less stressful.
- Defined calibration procedures provide a corporate "best practices" approach to calibration.
- Better decision making because of accurate data.

In the simplest terms, the new Beamex/Maximo calibration system gives back time to the people working in the field.

IN CALIBRATION SYSTEM UPDATES, IMPLEMENTATION IS THE KEY.

Our unique combination of calibration, project management and IT expertise helps you to face calibration system implementation projects that are typically complex and consume a lot of time and resources.

Calibration system implementation can be challenging

Specifying the new calibration process and sops **54%**

Implementing the new calibration process **54%**

"Selling" the new calibration process internally **42%**

Most demanding areas in calibration process updates

Source: ISA Study (2014), 360 respondents.

Average benefit shortfall **56%**

Average budget overrun **45%**

IT Implementation Project Failures

Source: Cross-industry study of 5,400 IT Projects. McKinsey / Oxford University.

But we have the skills

50 major calibration system implementation projects in last 3 years

10+ years average system implementation experience in the professional services team

23 Biggest system deployment project is 23 sites in 12 countries

175 Biggest global customer has 175 sites using Beamex software in 24 countries

200+ active Beamex software users in a largest one site.

5000+ additional software users in last 3 years

beamex
WORLD-CLASS CALIBRATION SOLUTIONS

News

Beamex and ISA's combined expertise attracts large crowds

■ Over the past year, Beamex and the International Society of Automation (ISA) have joined forces to generate a series of 90-minute education-based web seminars that teach viewers about current advanced process technologies. Attendees are invited to learn from and interact with experts, who cover subjects ranging from how to calibrate smart instruments to more strategic topics, such as how to implement a calibration process change. Question and answer sessions, along with live video feeds, engage the audience and bring new life to often tedious and technical topics. As one web seminar attendee explains, "The web seminar had a good content and visual aids. The presenters had prepared the topic with essential information that helps us in our daily activities."

The strong synergies that such an epic collaboration has inspired will continue this year. Attendance is a must for all those interested in increasing their knowledge base or in getting a refresher on the latest insights, trends and best practices to improve calibration quality, safety, accuracy and profitability, as well as lowering costs and optimizing

production. All live sessions are recorded and uploaded to YouTube to be viewed at your convenience.

To view these recordings, visit http://www.beamex.com/en/Training--Events/Seminars--Webinars/Past-Seminars-and-Webinars. To see the schedule and register for future web seminars visit, http://www.beamex.com/en/Training--Events/Seminars--Webinars.

Beamex launches a new firmware version 1.50 for MC6

■ Beamex have launched a brand new firmware version update for the MC6 advanced field calibrator and communicator.

The latest firmware version includes new functionalities, such as:

- Added support for the new panel-mounted MC6 Workstation model.
- Possibility to use the ITS-90 coefficients for platinum sensors.
- Improved support for Profibus instruments, with the help of Profibus Standard profiles.

In addition, various minor improvements have been introduced, including some corrections.

The updated firmware can be downloaded free of charge from Beamex's website. A more detailed release note is also available for download together with the new firmware.

Furthermore, new updated Device Description files have been published for HART, FOUNDATION Fieldbus and Profibus. The updated DD files are also available for download free of charge from Beamex's website.

Some of the MC6-related PC-tools also have new versions available for download from Beamex's website.

Beamex introduces a new advanced panel-mounted MC6 Workstation

Beamex introduces MC6 Workstation, a new and advanced panel-mounted calibrator and communicator.

■ In today's process industry, equipment is often calibrated out in the field. However, there are many advantages to performing maintenance and calibration tasks in the workshop, which often make this the preferred solution. For example, a workshop is a controlled environment, enabling better accuracy for calibration work. In addition, all equipment is always available and ready to use.

Beamex has been producing versatile, modular workshop calibration benches for more than 20 years. With the introduction of the new MC6 Workstation model, the calibration and communicator capabilities of the Beamex workshop offering are raised to a whole new level.

The MC6 Workstation offers calibration capabilities for pressure, temperature and various electrical signals. It also contains a full fieldbus communicator for use with HART, FOUNDATION Fieldbus and Profibus PA instruments. What really makes the MC6 Workstation unique is its usability. It has a large 5.7" colour touchscreen with a multilingual user interface.

The ergonomic design of the panel-mounted MC6 Workstation makes it ideal for sectors such as pharmaceuticals, energy, oil and gas, food and beverage and the service industry, as well as the petrochemical and chemical industries.

The MC6 is one device with several different operational modes, which makes it fast and easy to use - and technicians have less to learn. The operational modes include Meter, Calibrator, Documenting Calibrator, Data Logger and Fieldbus Communicator.

With the introduction of the new MC6 Workstation model, the calibration and communicator capabilities of the Beamex workshop offering are raised to a whole new level.

The MC6 Workstation communicates with automatic pressure controllers and temperature blocks, enabling fully automatic calibration.

In addition, the MC6 Workstation is part of the Beamex Integrated Calibration Solutions (ICS) offering. The MC6 Workstation is capable of communicating with Beamex CMX calibration management software, enabling fully automated and paperless calibration and documentation.

Beamex 40 years – the history

The founders of Beamex; Krister Knuts, Eero Halonen, Veijo Meriläinen and Nils-Erik Sundfors.

■ Beamex was founded in 1975 by four technicians: Eero Halonen, Krister Knuts, Veijo Meriläinen, and Nils- Erik Sundfors. The goal was to develop qualified measuring equipment that would better fulfil the needs of the user, compared to existing instruments used for measuring. The business plan also included exporting to other countries. These cornerstones of the business plan are still some of the main driving factors for Beamex, and today exports amount to 95% of the business.

Development of the first calibrators started at home in Eero Halonen's kitchen. The problem was simply a lack of adequate equipment for calibrating the industry's measuring instruments, but, according to Eero Halonen, the quartet had also discovered that in many companies only a third of the working time during instrument calibration was devoted to the actual calibration work, while the rest was spent on other activities. At Beamex they decided that it should be the other way around. They started out well and by 1976 they were already able to start recruiting new personnel; two years later they had developed their first calibrator for the market (the V/A calibrator) and had established relationships with several customers, including companies in Spain and Australia. Beamex's first delivery of 50 calibration workstations was to the Norilsk nickel smelting plant in the Soviet Union in 1978.

In 1984 when Beamex became part of the Sarlin group, they had 18 employees and turnover was around €3 million. In addition to calibrators, Beamex soon started to develop and sell software. In 1986 this resulted in the world's first calibration program that could communicate with a calibrator (PCAL). In 1989, Beamex were awarded the President's prize for exporting. At that time exports already accounted for almost 90% of turnover.

An important step in the promotion of exports was the nomination of so-called Premium Partners who functioned as distributors for Beamex products. The very first partnerships were established as early as the late 1970s, with GOING in Spain (now known as Gometrics S.L.) and AMS Instrumentation & Calibration Pty in Australia. In 1991 the Swedish company JMEX AB began to import Beamex products. Exports to Germany got under way properly in 1995 when an agreement was signed with Germex

GmbH. Today, these four distributors are still Beamex Premium Partners.

In 1993 Beamex expanded its business premises in Jakobstad, Finland and bought Nortech Systems in Atlanta, USA, who was a previous partner. The new subsidiary, Beamex Inc. which initially had a staff of five, was founded to strengthen the company's position in the USA. Soon, the sales company in Atlanta was expanded to include calibration services, and from 1993 onwards Beamex were also present in the UK as part of Sarlin Limited.

The development towards integrated calibration solutions

Beamex quickly expanded, even in the worst economic depression of the 1990s. One explanation for the success was the focus on integrated solutions, which included products, services, and service agreements; another was the heavy investments in product development. Beamex ICS, or Integrated Calibration Solutions, means that the software is smoothly incorporated into the customer's own ERP and that the data transfer between the Beamex calibrator and the software happens electronically. Calibration records are stored in the calibrator's memory and history can been analyzed. This process will avoid manual errors and improve the quality of the calibrations.

By the second half of the 1990s the company was exporting to more than 60 countries, as a result of products such as the QM6, and the MC5 multifunction calibrator was released in 1998. A few years after its introduction, the MC5 was complemented by further models, including the MC5P panel-mounted calibrator and the MC5-IS intrinsically safe, multifunction calibrator. In 2006,

This year, Germex celebrates 20 years as a Beamex distributor in Germany. In the picture, Patrik Wikström and Raimo Ahola hand over the Premium Partner certificate to Ralph Hoster and Gerd Strauchmann in 2008.

Beamex launched the world's first fieldbus calculator, also from the MC5 family. In the mid-2000s several new products were introduced, such as the MC2 product family, which was complemented a couple of years later by the MC4 documenting process calibrator, for the calibration of parameters such as pressure, temperature, and electric signals. The QM6 software was replaced by CMX in 2004.

An important date in Beamex's history was February 22, 2012: it saw the launch of the forerunner MC6 advanced field calibrator and communicator. The slogan for the MC6 is "More than a calibrator", meaning that the calibrator uses three different communication protocols: HART, Fieldbus, and Profibus, as well as a communicator. The biggest launch in Beamex history was followed by a roadshow, where 17 European countries were visited during a two-and-a-half month tour.

Over the past 40 years, Beamex has significantly expanded and developed, and now has its own sales operations in the USA, UK, France, China, India, and Saudi-Arabia, and has more than 80 distributors all over the world: Beamex is one of the most significant companies in the world when it comes to calibration. Beamex has had its own calibration laboratory since 1997, accredited in accordance with ISO 9001 and ISO 17025 standards.

In January 2015, the North American Control magazine for professionals, acknowledged Beamex as the third most important calibration brand in the world, as voted for by the magazine's readers.

Beamex is celebrating their 40 year anniversary by posting facts about the company's history and current news every week on social media and on their websites. You can follow us on www.beamex.com or on the Beamex Facebook page, www.facebook.com/beamexcalibration.

TAPANI RITAMÄKI
THE SARLIN BOOK

Successful user group meeting held in Pietarsaari, Finland

The participants of the user group meeting.

■ This year on March 4–5, around 20 people from 9 different companies in Finland gathered at Beamex headquarters for a user group meeting. Many different industry sectors were represented, including the power generation, refinery, gas, manufacturing and pharmaceutical sectors; the customers were software users and documenters of calibration. Peer-to-peer networking is always a big part of this kind of event and the participants learned a lot, not only from the presenters, but also from each other. The event comprised two intense days with workshops, temperature calibration in the Beamex laboratory, calibration services and product education for both hardware and software solutions. The training sessions were followed by plenty of discussion on how the users were utilizing the Beamex calibration system. The feedback from the participants was that the event was very informative, useful and positive!

Beamex in brief

Beamex is a leading worldwide provider of calibration solutions that meet even the most demanding requirements of process instrumentation. Beamex offers a comprehensive range of products and services — from portable calibrators to workstations, calibration accessories, calibration software, industry-specific solutions and professional services. Through Beamex's partner network, our products and services are available in more than 80 countries.

Learn more about Beamex products and services
www.beamex.com

Brochures, product demonstrations and quotations
info@beamex.com
www.beamex.com/request (online request form)

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Please visit www.beamex.com
or send an e-mail to info@beamex.com

Beamex products and services

Portable calibrators
Beamex's range of portable MC calibrators for field calibration is known for accuracy, versatility and meeting both high and uncompromised quality standards.
- MC6 advanced field calibrator and communicator
- MC5-IS intrinsically safe multifunction calibrator
- MC2 series
- MC4 documenting process calibrator
- MC2-IS intrinsically safe multifunction calibrator
- FB/MB temperature dry blocks
- POC6 automatic pressure controller

Workstations
A workstation can be considered ideal when most of the maintenance and calibration tasks are performed in the workshop.
- MCS200 calibration workstation
- MC6 Workstation

Accessories
Beamex's calibration accessories complete your investment in calibration equipment.
- External pressure modules
- Calibration hand-pumps
- Spare parts

Calibration software
Plan, manage and document all your calibrations efficiently and safely using Beamex's calibration software.
- CMX Light
- CMX Professional
- CMX Enterprise

Professional services
An essential part of a complete calibration solution is professional services — service and re-calibration, installation and training, software support, validation services and integration services.
- Re-calibration and service
- Installation and training
- Software service agreement (SSA)
- Validation services (pharmaceutical industry)
- Integration services



The new features of Beamex MC2, MC2-IS and MC4

Beamex MC2, MC2-IS and MC4 have a new display and a new display lens. The new display includes a bright LED backlight, which improves the visibility of the screen in various industrial environments. The new Gorilla® glass lens is tough and survives in industrial environments without getting scratched, ensuring the best display visibility through many years of use.

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WORLD-CLASS CALIBRATION SOLUTIONS

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Workstations
Calibration software
Professional services
Industry solutions

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