Training – the 4th pillar of the Y2K four pillar concept

As part of its group-wide programme addressing the year 2000 issue, ABB has created a 'four pillar' concept designed to give optimal support to customers operating plants with ABB control systems. Successful completion of the work covered by the first three pillars – the investigation of ABB products, the establishment of an inventory of installed plants, and the execution of pilot projects – is being followed up by an intensive effort to provide training programmes for customers' and ABB service personnel.

As a leading supplier of equipment to electric utilities and industry in general, ABB is investing a huge effort in making sure that there is only a minimal risk of customers' processes being disrupted by the so-called 'millennium bug'. The strict timeframe for this work made it necessary to develop a special strategy for evaluating the susceptibility of installed process control systems and provide a platform for corrective measures. To this end ABB created a 'four pillar' concept that offers customers maximum support in their efforts to minimize the potential impact of the Y2K bug [1]. This programme is now well under way and some preliminary findings can be confirmed:

- Y2K investigations are made difficult by the fact that there are usually only very few Y2K-critical locations in a typical installation.
- Many highly qualified people are needed to carry out the investigations and assessments. They must understand in detail both the vertical and the horizontal complexity of plants and installations.
- While resources are available for the assessments and remediation, a very tight time schedule has to be strictly followed. Personnel from ABB and from the customers have to work together on the Y2K problem.
- Training in the specific skills and knowledge needed to tackle the Y2K problem is available.

Training is an ABB core competence, providing support for customers in installing new products as well as in setting up and running new installations. It is used extensively to disseminate ABB's know-how and experience to customers to help them make their plants 'year 2000 ready'.

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The four pillar concept

The four pillar concept was developed to give optimal support to customers operating plants in which ABB control systems are installed. The *first pillar* covers the investigation of ABB products, delivered and in service, for the purpose of evaluating their compliance status. The results of these investigations form the indispensable basis for all other assessments in customers' plants and installations.

The *second pillar* covers the preparation of inventories for customers' plants around the world. The starting point for this phase was ABB's documentation of deliveries to customers' sites. Customers were involved in this work to enable them to add their know-how and field experience to the knowledge base. This is necessary since, in many cases, new equipment will have been added to the process plant, old equipment will have been updated, or replacements will have been made. Without a detailed inventory, neither remediation work nor resources can be planned properly.

At a very early stage in the development of this concept it became obvious that a large number of specially skilled people would be needed to go through the customers' plants and installations in the necessary detail. The manpower needed to assess, remediate and test the plants has been estimated at several hundred man-years. Obviously, this demand on manpower cannot be met by ABB staff alone; experienced personnel, especially from the service departments of the customers, have to be involved. The only way to solve the problem was to push ahead quickly with high-profile Y2K programmes for assessing the thousands of plants and installations with ABB control systems before the roll-over to the year 2000.

The *third pillar* covers the setting up of special methodologies for assessing cus-

tomers' installations and developing appropriate corrective measures. ABB's approach to this is based on the idea that the tens of thousands of installations worldwide can be sorted into a limited number of typical and more or less repetitive classes. Personnel with special analytical skills, including staff from ABB Corporate Research Centers, have been engaged to set up the methodologies for full-scale plant assessments and remediation processes. While it is unreasonable to expect that the methods set up in the pilot plants can be applied to all others on a one to one basis, this approach has the inestimable advantage that it ensures that repetitive errors are avoided and efficiency is improved when assessing similar plants. General engineering know-how as well as project management skills are needed to apply the methodologies developed by ABB in the pilot plants.

The experience gained in the third pillar provided the 'raw material' out of which many lessons have been learned and from which the *fourth pillar* – training – profits.

Status of the four pillar programme

The activities related to pillar 1 have been completed, although one or the other older product or software release found in an installation may still be undergoing some tests. In the meantime, more than 3,000 ABB products and standard systems with potential Y2K risks have been investigated. It was found that only about 10 % of them (hardware as well as software) need patches, updates or, in rare cases, replacements. The compliance status levels of most of these ABB products are published on the internet [2].

The establishment of inventories under pillar 2 can also be taken as completed. Some customers, however, still have not replied to repeated invitations to participate. It is to be hoped that these latecomers may still be convinced that involving ABB is much better than getting third parties involved or, even worse, doing nothing at all. At this point it has to be said that limited resources impose a very tight schedule on the remediation work, and it is very likely that latecomers will encounter problems with obtaining the necessary resources for their needs within the time periods they envisage.

Pillar 3 is also far advanced, if not quite completed. Since this work provides the basis for pillar 4, all of the important findings have been documented and made available to ABB personnel and customers' staff involved in Y2K activities. The findings in more than 60 pilot plants which have been thoroughly investigated have been documented in detail and sent to every department within ABB where similar installations have been identified. This work, which is still going on, continues to provide a constant stream of knowledge and new experience. Based on these findings, the ABB Y2K Training Task Force has developed and is constantly improving relevant training modules.

Very often, results from the pilot plant projects carried out under pillar 3 have been used at meetings with customers to show them practical examples of the year 2000 problems and to point out the applicability of the findings to their own installations. This has resulted in many cases in the immediate start-up of a project with ABB aimed at making their installations 'Y2K ready'.

Pillar 4 is running well, and a very large percentage of the ABB personnel involved in the year 2000 activities have been trained in their work. This effort was vital to get the necessary volume of resources up and running. The training of customers' personnel began slowly, but the beginning of 1999 showed an important increase in the volume of customer requests received. Consequently, training courses are now

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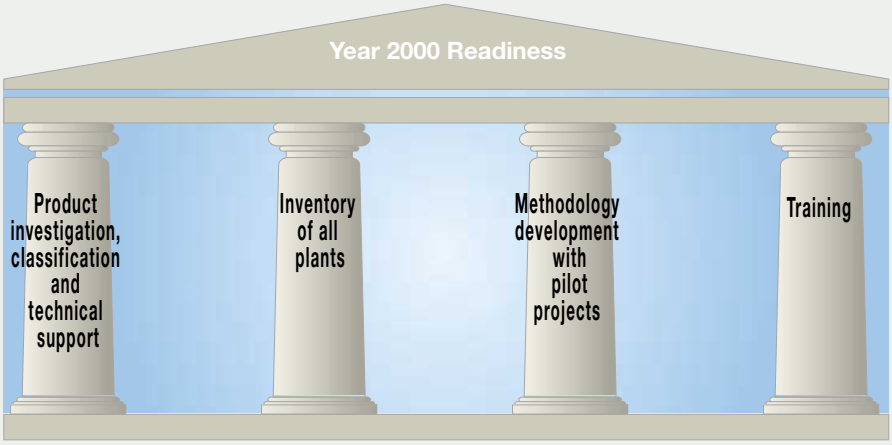
Readiness programme for ABB products and customers' plants



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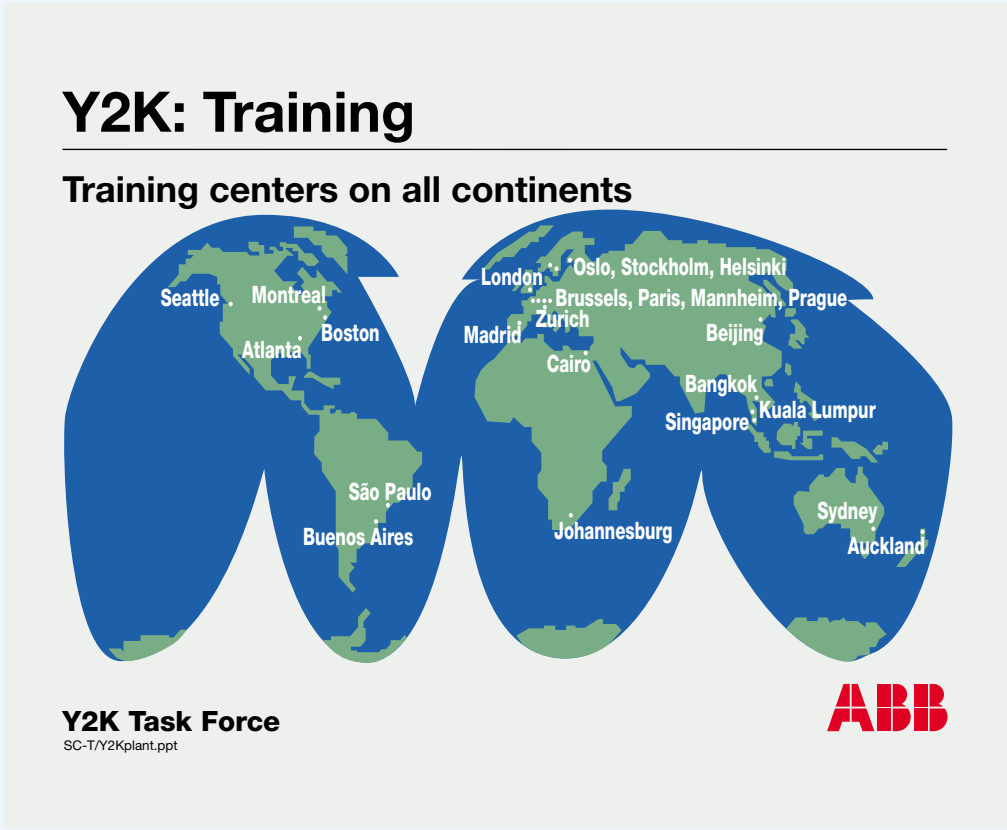
being held at locations around the world. On-the-job training with ABB personnel working in customers' installations supports these courses and ensures that there is a maximum transfer of knowledge from ABB to customers' personnel.

All in all, the results have confirmed that the ABB four pillar concept is completely valid for full-scale applications.



ABB's unique customer support offer

It is clear from the experience to date that the first two pillars, 1 and 2, covering the investigation of ABB products and the establishment of an inventory of all plants and installed products, are basic common sense and that more or less every supplier has a programme for carrying out this work. Where ABB is going an important step further is with the idea of pillars 3 and 4. These are the areas in which ABB shows it is taking the partnership with its customers seriously, and that customer satisfaction is not just a word but a promise in the stage of being fulfilled. ABB is bringing together all of the expertise available throughout its worldwide organization, involving corporate research, product development departments, test laboratories, service organizations and training centers, with their proven experience in conveying knowledge to a broad audience.

Training – an ABB core competence

When introducing new products or handing over complete installations to customers it is necessary to train the customers' personnel in new technologies and techniques. ABB has long relied on training centers, set up around the world, to provide the high level of training required. As can be shown, the return on this investment (ROI) in training – in terms of avoided outages – can be extremely high. Training not only helps to ensure the quality of services in a major way but also secures the value of capital investments. Although it normally has a relatively low profile, training is considered an important area by ABB and therefore a core competence of the company. This competence is integrated in the ABB Y2K activities through pillar 4 of the four pillar concept.

Training designed to meet the year 2000 deadline

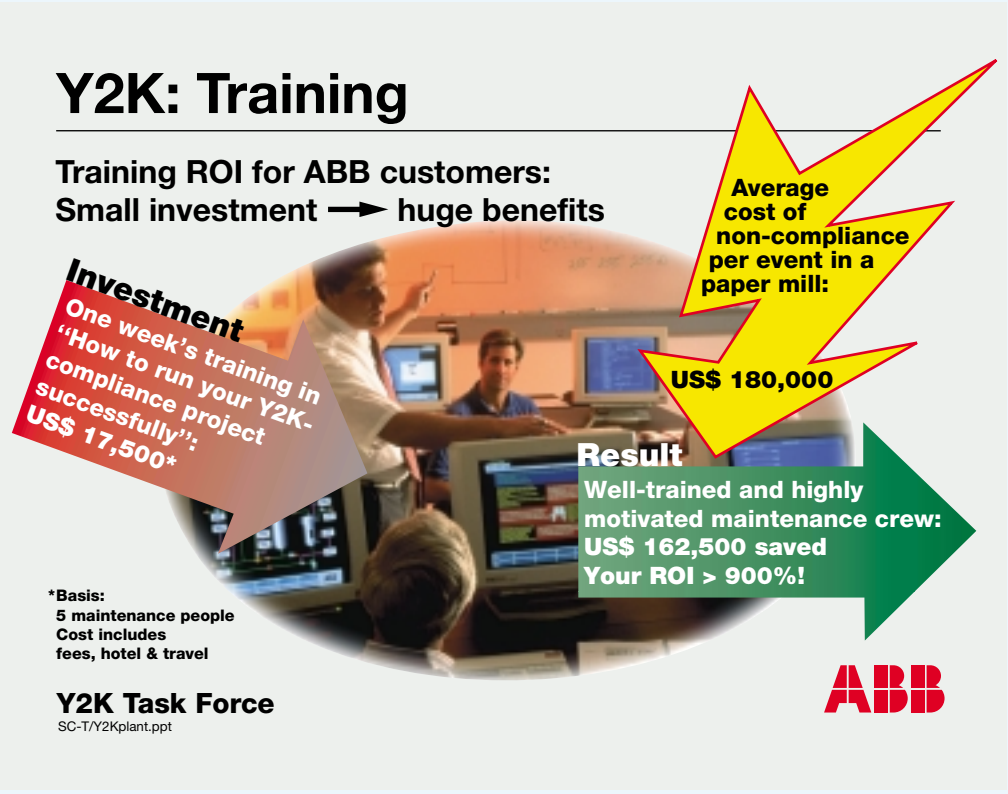
The ABB training concept for the year 2000 remediation process is divided into six standardized modules, each of which comprises numerous sub-modules in the form of specific sessions. These sessions may be used several times in the different modules, depending on the audience, its level of knowledge and the subjects being dealt with in the training course, which may vary from place to place.

The first two standard modules specifically address ABB personnel, whereas the third and fourth modules are of equal importance to ABB and the customers. For this reason, joint sessions are often held in which ABB and customers' personnel learn together.

Start-up of training

When the decision was taken in mid-1998 to go ahead with the ABB Y2K four pillar concept, many people within ABB still had to be made aware of the year 2000 issue. This was necessary in order to get people to participate in the fast-growing project and to free the specialized resources needed to investigate products and to begin with the analyses of the pilot plants. A training module was quickly developed for this group of people and sessions based on it were held in many places around the world.

Another group of ABB personnel responsible for the Y2K contact with custom-



ers also had to be trained, not only in the Y2K issue but also in the use of the support package that ABB was offering. This was sometimes an unusual mission for ABB sales engineers as they normally sell well-defined products and systems rather than consulting services. To this end, a specialized training package was delivered to ABB companies all over the world.

ABB could not be certain during the second half of 1998 that the awareness module would receive the customer attention that was required. However, the impact the training module had on customers' organizations was, in the majority of cases, as good as had been anticipated, as was the general response by middle management. As a result, these organizations experienced an 'awareness leap' and will definitely be ready for the roll-over to the year 2000.

The focus of interest has since shifted to the more practical 'project methods and analysis' and 'implementation and testing' modules.

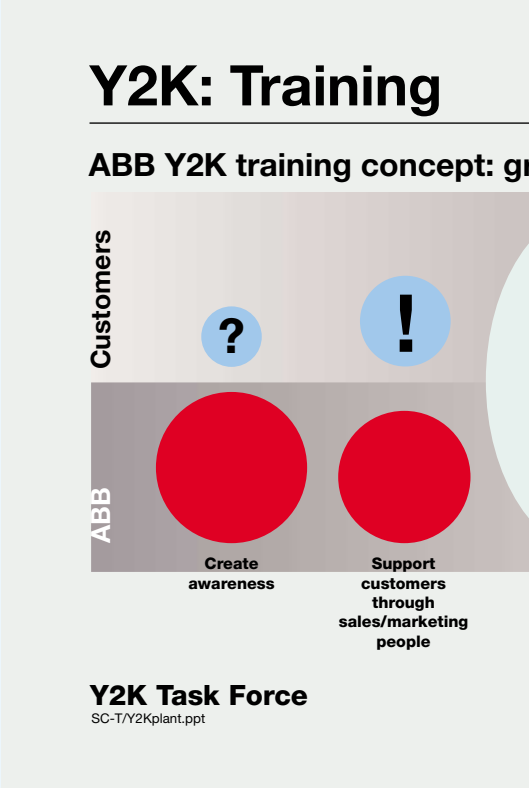
Investigation methodology and project management – a module for both ABB and the customer

Once the customer and ABB have agreed to start with the investigations and an analysis of the customer's plants it is extremely important for the first steps to be carried out correctly and efficiently. The know-how necessary to do this is not commonly available and may vary from one type of plant to another. The methodology comes, as already mentioned, from the investigations carried out in the pilot plants. The training may cover simple questions, such as which cubicle has to be looked in for hardware and software with a Y2K risk. On the other hand, very sophisticated tools are needed to scan the codes of the application software.

Before this can be done, a professional project has to be set up jointly. The training module contains the principles of the project management methodology needed for this. The project organization as well as the interface between the responsibilities to be shared by the customer and ABB must be defined and documented in a professional way.

This involves a contractual document in which the rights and duties of both partners are laid down. Defining and understanding the mutual rights and duties should not be viewed purely as legal work; more importantly, it lays the foundation for a successful project. ABB has developed a contractual frame for this which many customers have already signed and appreciate as representing a well-balanced formulation of the mutual responsibilities.

Both parties then have to agree upon how to document the findings, the jointly developed solutions, the setting up of the tests and the test results. The reason for this is not, as it suggests, to avoid possible litigation at some later stage. Instead, the main objective is to provide documentation which could be checked later in order to improve the remediation measures, either before or after the year 2000 deadline. Clearly, detailed and unambiguous docu-



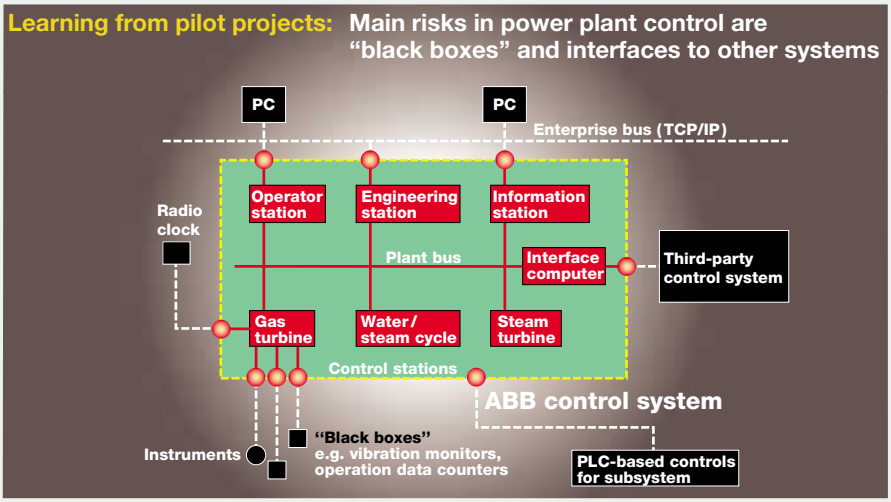
mentation will make follow-up projects and possible later upgrades with extra functional capability easier. Templates have also been developed by ABB for this work which saves both the customer and ABB hundreds of man-hours during this part of the process alone.

The training modules suggest procedures and give examples taken from the pilot plants for providing support and helping with the inventories and analyses. Checklists are available as well which help users to focus on the parts of a plant where there is a potential Y2K risk.

Another topic of this training module, involving both the customer and ABB, is the cooperation between the customer and third-party suppliers. When establishing jointly an inventory of products and system components within a customer's installation, it is obvious that not only ABB deliveries but also those of third-party suppliers have to be considered. ABB cannot, of course, accept any liability for these, but it can help the customer to establish proper channels of communication with the suppliers. Here, ABB once again makes its wealth of experience in dealing with a broad range of suppliers and in handling the supply chain process available to customers.

A further training sequence addresses the manifold interfaces with other systems. Very often, installations work with a large variety of these. Typical examples are integrated management and information systems and load dispatching systems. In many cases, there may also be control systems from other suppliers. Systems which at the beginning are usually of minor interest are also found (fire alarms, escalator controls, etc). ABB is often confronted with complex situations which have to be especially addressed through the training courses. Finally, a recommendation is given as to those parts of the installation which need to be tested before upgrading of systems or equipment.

Y2K: Training



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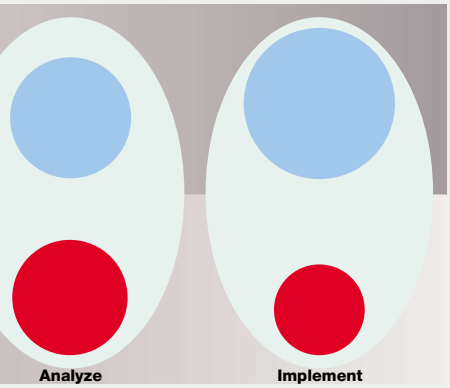
Remediation and fixing bugs – involving the customer even more deeply

The training package for making an installation Y2K ready has a generic part which covers the methodology, the start up, preparation and documentation. The second part of the package is more specific, and addresses the type of plant as well as all the products installed and due to be upgraded, patched or replaced.

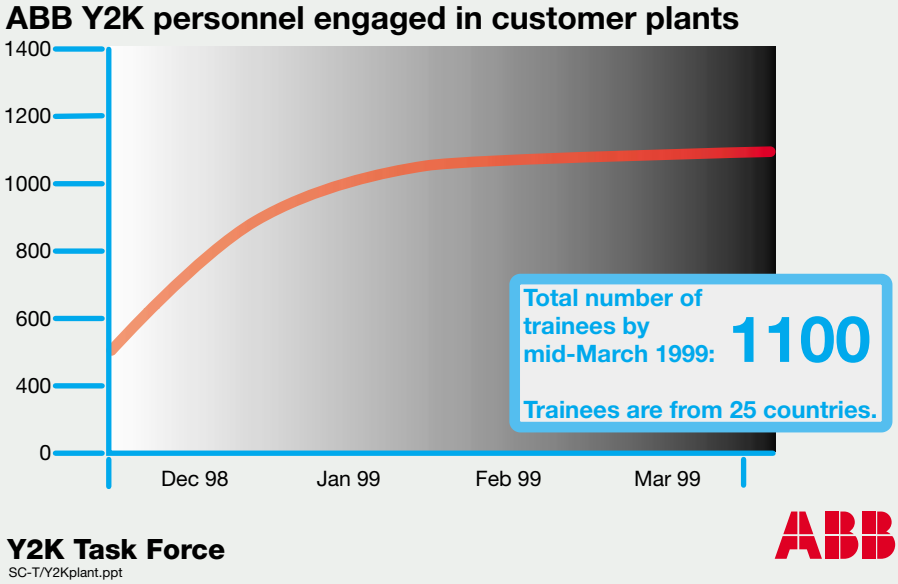
The sources of this knowledge are, on the one hand, the results of the investigation and testing of the pilot plants and, on the other, all the experience which has been gathered during the assessment and investigation of the ABB products. In addition, advice is given on how to proceed with the third-party suppliers for remediation of their products.

Also included in this last training package are the highly specialized modules for the different ABB products and systems. The training centers around the world have been instructing customers' personnel in

rowing customer involvement



Y2K: Training



these product-related and specialized skills already for many years. Within the ABB Y2K programme they offer the training sessions necessary to fix bugs and install and test updates.

Summary

The pillars making up the ABB four pillar concept have to be 'erected' in the right order if they are to carry and support the 'roof' representing Y2K readiness. Training, since it is the final pillar, is one of the most important elements in the four pillar concept. It is this pillar which is designed to disseminate the knowledge acquired by ABB through the dedicated work of many hundreds, if not thousands, of ABB employees involved at every stage of the Y2K programme. The training courses, which are still being held at ABB training centers and customers' sites around the world, are highly flexible. They can be adapted to the exact needs of the target audience and are designed to help both ABB and customers' personnel, either separately or together.

ABB training centers around the world are being used to communicate Y2K knowledge to customers' personnel.

References

[1] K. Ragaller: Y2K readiness through close partnership with process control users. ABB Review 6/98 41–48.

[2] Internet: www.abb.com/y2k

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