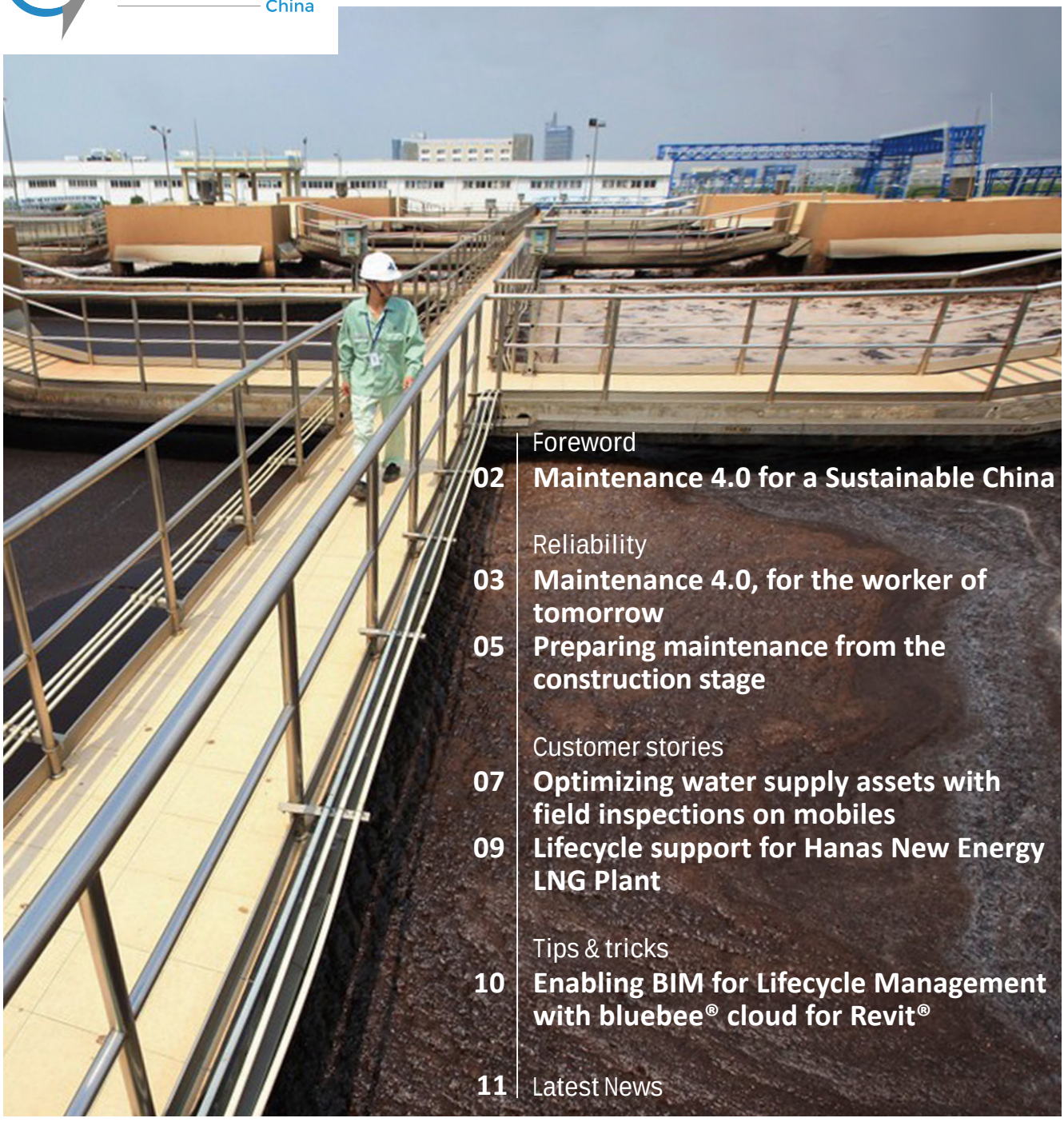
Maintenance in China

This is the printed edition of Siveco China's monthly email newsletter "Maintenance in China". To subscribe to the electronic version or to read previous issues, please register online at newsletter.sivecochina.com. 本期内容另有中文版可供参阅



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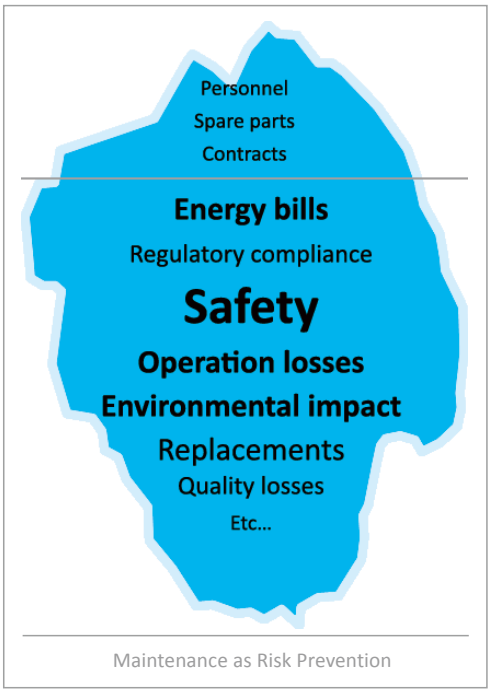
Maintenance 4.0 for a Sustainable China

My first China experience dates back to 1998, when we struggled to implement preventive maintenance at a Suzhou paper mill. I later went on to work for the Chinese power industry. Almost two decades later, we still face the same challenges, trying to break inefficient firefighting habits and to develop sustainable preventive maintenance organizations.



Has anything changed? Yes! In the era of the China Dream, there is widespread awareness of safety, sustainability and their relation to maintenance. Maintenance as Risk Prevention. Today's modern "Industry 4.0" plants require more advanced maintenance skills, not less. Companies have also learnt the hard way that applying Western solutions to Chinese problems usually doesn't work… and that technology is not a miracle cure.

Facts have proven us right! At Siveco we have over the years developed an offering combining maintenance expertise and innovative technology, designed to address the specific needs of "maintenance with Chinese characteristics". Siveco made the opposite choice of most suppliers, as we believed in inventing a Chinese way.

Our bluebee® suite of products "for the worker of tomorrow", putting man, not machine, at the center point, has won many awards. Dozens of clients have enjoyed great results, as shown in our many case studies, and we have even started exporting our know-how, working alongside China-based investors and EPC companies in Asia and Africa.

We call this approach Maintenance 4.0.

It is also the theme of this newsletter. The first Reliability article goes beyond the marketing hype to explain what Maintenance 4.0 really means for us in China. The second one details how preparing maintenance during the construction stage is key to optimizing the lifecycle of infrastructure and plants. Two case studies illustrate the concept, respectively at Chongqing Sino-French Water and Hanas New Energy LNG plant. The Tips & Tricks article features the integration of BIM (Building Information Modelling) for Maintenance, with an example from oil company CNOOC. Readers will find many more bilingual articles and real-life stories of Maintenance 4.0 success online at newsletter.sivecochina.com.

Technology is no silver bullet. It should be designed to tackle the actual challenges we face as we build our China Dream, while taking advantage of the great openness of our people towards innovations. Implementation is never easy, but improvements are achieved at every step in the project, progress is made and we all learn every day.

There has never been a more exciting times for maintenance professionals!

Bruno Lhopiteau
General Manager of Siveco China

Maintenance 4.0, for the worker of tomorrow

The world has known three industrial revolutions and the fourth one is well on its way. Dubbed Industry 4.0 by German industry strategists, it promotes increased computerization and integration of industrial systems. With Industry 4.0, all the latest buzzwords: Big Data, 3D printing, Internet of Things, Cloud Computing, Smart Factory, BIM and many more, get combined into one single concept or, as some contrarians might say, one giant marketing gimmick.

As often in China, this initiative has taken a life of its own and is seen as a silver bullet that will allow the country to leapfrog its current industrial challenges, into a future dominated by Chinese industrialists. And it may well prove to be true… as long as the crucial human obstacles we are facing are not ignored by technology-obsessed managers.

Industrial IT in China, mixed results

The basic principle of Industry 4.0 is that interconnected machines and systems will form an intelligent self-controlled network spanning the entire value chain. In the ideal factory, machines autonomously react to unexpected changes in production, predict failures and trigger maintenance processes. How does this Industry 4.0 dream of technology-enabled just-in-time maintenance and near-zero downtime translate into our daily Chinese reality?

Anyone who has worked in the industry for any length of time has seen more than his share of fancy technology left unused because it failed to address local needs and relied on skills not readily available in China. Industrial IT provides the best examples:

Lack of proper as-built documentation remains a major problem, which expensive BIM (Building Information Modelling) technology is not addressing.

A reactive approach to maintenance is still the rule, while CMMS/EAM are setup to automate these incorrect processes rather than inculcate best maintenance engineering practices.

Most Building Management Systems (BMS) do not fulfil their intended role, due to design mistakes and failures of sensors too complex or costly to maintain.

As more sophisticated and automated systems are put in place, companies become more reliant than ever on hard-to-find skilled maintenance managers, engineers and technicians. Overhyped plans to install millions of robots to replace decently paid Chinese workers have so far failed to materialize, perhaps because the required maintenance workers are nowhere to be found.

BIM in real life

The challenge of maintenance

To succeed in China, Industry 4.0 should not ignore the maintenance challenge. In fact, Maintenance 4.0 lies at the core of this fourth industrial revolution. Instead of replicating a western model, as previous industrial IT initiatives have done, it must be redesigned to meet our Chinese needs.

Yet engineers tend to be very specialized and lack the multidisciplinary skills so crucial to manage maintenance: basic knowledge of mechanics, electricity, automation and an overall business view to understand the impact of technical decisions. Maintenance is still considered a very unglamorous career choice. The discipline is largely ignored by universities and professional schools. The fundamentals of preventive maintenance remain largely unknown. Staff turnover is an issue. These are the very challenges that Maintenance 4.0 must address in this country.

In China, Maintenance 4.0 must kill two birds with one stone.

Maintenance 4.0 in practice

At Siveco, we have been practicing this Maintenance 4.0 “with Chinese characteristics” for many years, albeit under other names.

We use innovative technologies, designed by our Chinese R&D unit but backed by decades of experience in other markets, as a tool to enforce best practices from top management down to individual workers. Our bluebee® mobile solution “for the worker of tomorrow” requires technicians to scan asset tags (typically QR codes). This simple constraint helps drive a maintenance engineering project, since it requires up-to-date equipment lists, inspections points and maintenance instructions. Once in operation, it ensures technicians actually perform inspections or preventive maintenance actions.

Industry 4.0 should not ignore the maintenance challenge: in fact, Maintenance 4.0 lies at the core of the fourth industrial revolution.

While using bluebee®, maintenance staff acquire new knowledge on the job, which is proven to be the most effective way to learn. Higher motivation results, as workers feel gratified by the use of modern technology and benefit from upgraded skills.

With well-established processes and systems in place, companies also become less dependent on individual employees.

Once the importance of the worker has been reestablished, there is no denying that automation plays a major role in Maintenance 4.0. To support a maintenance strategy based on predictive maintenance or condition monitoring, bluebee® connects to Connected Objects such as Bluetooth instruments and sensors, as well as to supervision systems (SCADA/DCS/BMS) via the bluebee® sync platform. With bluebee®, workers plays the key role in the Internet of Things (IoT).

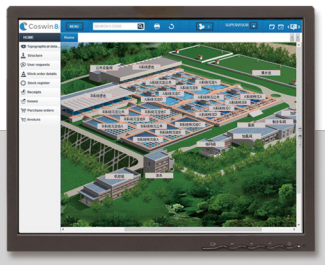
Hundreds of clients, thousands of technicians have used our solutions and obtained measurable ROI, including leading multinationals in China, such as Essilor, Hanwha Chemicals or Nokia, but also local firms like Baida Air, Beijing Environment, Fushun Mining or Lutianhua. bluebee® has won multiple industry awards in the past few years.

bluebee® cloud helps multisite organizations manage their Assets, Facilities, Field Service and Risk Prevention in line with international standards (ISO 55000, ISO 31000).

bluebee® cloud

bluebee® is a unique tool designed "for the worker of tomorrow" to capture information from the field and to enforce systematic recording of failures, non-compliances and work done. bluebee® also integrates with IoT and control systems.

bluebee® mobile and tablet



Coswin 8i is a Computerized Maintenance Management System and Enterprise Asset Management solution designed to help companies increase their profitability while ensuring regulatory compliance.

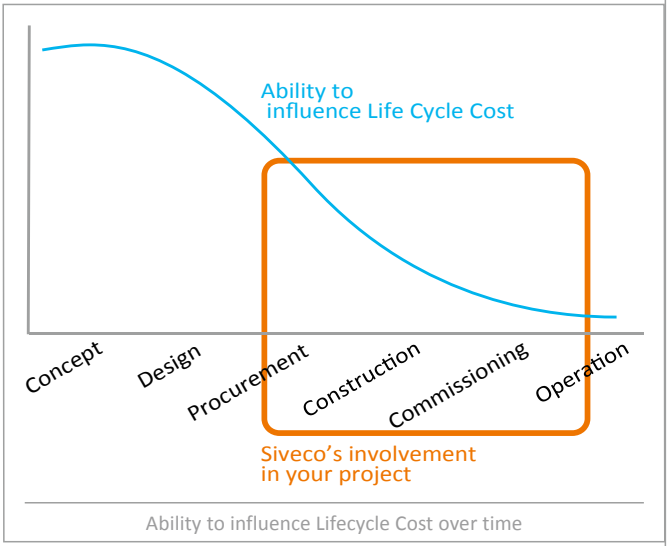
Coswin

Find more about Siveco's Maintenance 4.0 solutions at www.sivecochina.com/en/products

Preparing maintenance from the construction stage

The earlier the better

Experience has shown that the earlier reliability and maintainability are taken into account in a construction project, the better. These should be specifically addressed from the design stage of a project, as illustrated below.



Ability to influence Lifecycle Cost over time

This approach, which consists in paying more attention to maintenance earlier in the project, to reduce future operation cost, differs markedly from that of Chinese engineering and construction companies, which emphasize cost control during construction with progressive adjustments of the design as the project moves ahead. Local EPC companies still lack an overall lifecycle perspective, hence the difficulty to obtain as-built drawings or preventive maintenance recommendation from them.

While the resulting speed and cost advantage has proven critical to support the country's fast development, this approach has also led to problems – most notably in terms of safety (too many deadly accidents made headlines in the past few years) and maintenance (early replacement of major equipment, spiraling cost and reliability problems after a few years of operation). Partly as a result of this lack of preparation, maintenance is often purely reactive (firefighting) in the operation phase.

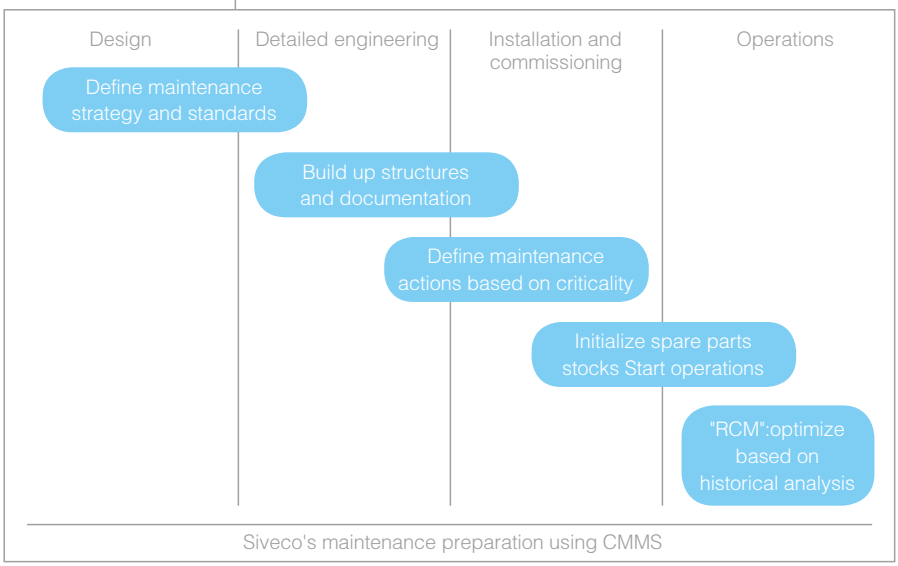
As a direct consequence of this lack of early concern for maintenance during construction, we observe that the quickest reliability improvements obtained during Siveco projects in China are those related to design or installation problems, which should have been identified during commissioning, but instead go undetected for years. Quick fixes are applied, problems go unreported and no analysis is ever carried out. By conducting systematic root cause analysis, we are able to identify the problems and trace them back to construction issues.

The Siveco Way

Based on a long experience of greenfield infrastructure projects all over the world and lessons learnt in China in the past 15 years, Siveco has developed a specific expertise working alongside EPC companies and their equipment suppliers during the construction phase, ensuring smooth transfer of technical documentation from construction to operation, supporting plant commissioning and start-up with an accurate technical database and enforcing good maintenance practice from day one.

In China more than anywhere else, the CMMS turns out to be the ideal tool to bring structure to what would otherwise be perceived as a very abstract concept ("Prepare for maintenance? But the equipment has not yet been delivered!"). A concrete (deliverable) system, the CMMS allows us to clearly define steps in the maintenance preparation project. The "high-tech factor" introduced by the CMMS is of course a key motivator for engineers involved in the project.

The figure below summarizes the Siveco approach for maintenance preparation during a construction project based on the utilization of the CMMS:



Siveco's maintenance preparation using CMMS

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Siveco helps ensure a smooth transfer of technical documentation from construction to operation and enforce good maintenance practices from day one.

The major benefits of this approach are highlighted below:

- **Detailed, accurate and easily accessible technical documentation**

By working directly with suppliers, detailed and accurate technical documentation (specifications, contracts, spare-parts lists, etc.) can be made available to operation engineers in a structured manner directly in the CMMS, instead of being stored in containers, in shelves or even missing. This has a direct and immediate impact on the accuracy and efficiency of the work as well as on day-to-day decisions (where to purchase a part, how to disconnect an equipment etc.)

- **Integration with automation systems**

The construction phase is obviously the best time to integrate the CMMS with automation and supervision systems (DCS, SCADA, BMS) that contain essential data for maintenance planning, as both systems can be designed and built accordingly. Large cost savings can be expected compared to integrating systems after operations have started. More importantly, more advanced functionality can be obtained, such as a full HMI integration (operators can access technical documentation directly from their control screen) and more meaningful data transfer (e.g. traditional interfaces will transfer alarms and measurements to the CMMS indiscriminately, while in a joint implementation, the process will be designed to match the maintenance strategy).

- **Integration with BIM**

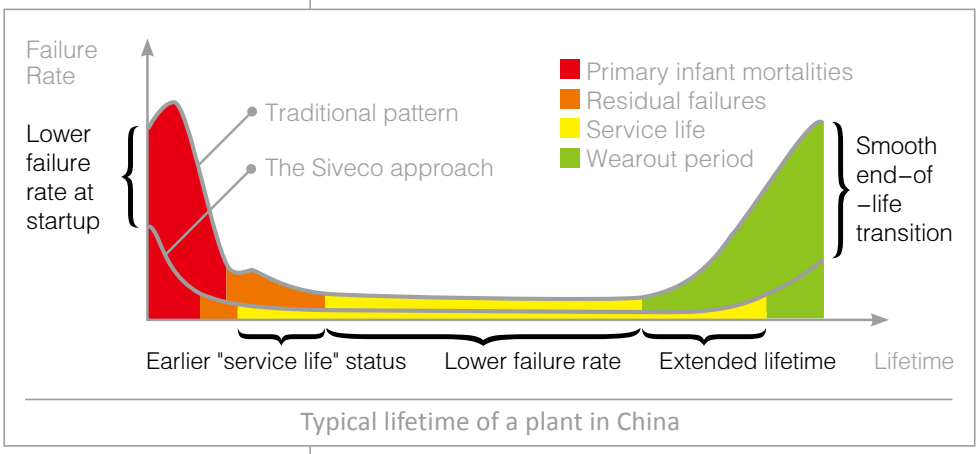
More and more projects use BIM for design and construction purposes. Building the CMMS from the construction stage allows all CMMS data to be "natively" integrated with corresponding BIM data: while the BIM model holds architectural and spatial data, all equipment is linked to the CMMS database which contains advanced O&M data such as technical specifications, spare parts lists, documents, maintenance instructions. Such data, critical for future operation, requires specific consulting skills and database technologies than BIM suppliers do not provide. This approach allows the smooth buildup of completely integrated CMMS-BIM. Siveco software products all provide user-interface integration allowing users to view the model (usually in Revit format) inside the CMMS and to access all data from CMMS to BIM, from BIM to CMMS.

- **Support for commissioning**

Engineers supervising the commissioning process can be equipped with mobiles, allowing them to record each step of the process and corrective actions if required, ensuring follow-up of actions performed by the construction company or equipment suppliers. Faults occurring at an early stage – commissioning, trial runs – can be accurately documented in the CMMS historical database. Without a proper historical record, information will be lacking for future diagnosis, resulting in delays and temporary fixes rather than permanent resolutions of problems.

The big picture

For a major infrastructure project or large plants, the approach described above could easily save millions of RMB every year in indirect or consequential losses: downtime, increased repair costs, recurring problems etc. By taking maintenance into account early, it takes less time to get into the "useful lifetime" part of the famous reliability "bath-tub" curve (smoother commissioning, fewer residual failures), while the "wearing out" part will be delayed (longer equipment lifetime).



Maintenance 4.0 in practice: optimizing water supply assets with field inspections on mobiles

This project was nominated for the 2015 Sino French Water Innovation Trophies.

Chongqing Sino French Water Supply Company Limited

Chongqing Sino French Water Supply Company is a joint-venture of Chongqing Water Group and Sino French Water, supplying drinking water to 1.2 million people. Chongqing is China's youngest municipality under the jurisdiction of the central government and the gateway to Western China. This JV was the first concession project following the opening up of China's distribution networks to foreign involvement and also Sino French Water's first large full services venture in China. In operation since November 2002, the JV remains the sole drinking water supplier and network manager for the districts of Jiangbei, Yubei and the new developed zone in the Northern part of Chongqing. This area is developing quickly and, over the past years, the demand for water has grown at an average rate of 14% per annum. In 2009, the JV also secured a new drinking water distribution contract for Yuelai District, with a daily capacity of 600,000 m3, representing a total investment of RMB1.5 billion.

The project

To meet its maintenance improvement objectives, Chongqing Sino French Water has implemented the Coswin computerized maintenance management system since the beginning of 2013, covering the operation of 4 subsidiary plants. By getting rid of its old-time Excel-based management model, the project helped Chongqing Sino French Water build up a complete technical database and streamline its previous preventive maintenance plans and fault reporting system, while optimizing decision-making through reports and KPIs generated by the system.

After one-year operating with the system and the results obtained, new requirements were raised by the management team: based on the CMMS, how to fill in the gap between onsite inspection and back-office engineering? How to replace the current paperwork by state-of-art technology? How to implement the best maintenance practices in the field? How to analysis the performance of inspection? How to motivate junior technicians?

Inspired by the concept of "Maintenance 4.0", Chongqing Sino French Water was determined to use advanced mobility tools to improve the inspection work.

The goals

Based on initial studies, the project aimed at achieving the following objectives:

- Link the Work Orders (WO), preventive maintenance plan and fault codes (Symptom, Defect, Cause, Action) from the CMMS to onsite users, in order to bridge the gap
- Streamline the inspection SOP based on ISO 55000 and set up a comprehensive inspection technical database to prevent mistakes in the field
- Use technology to guide end-users to follow the best practices while improving work safety
- Provide technical-financial decision support based on analysis of inspection results
- Motivate the staff by fancy technologies, becoming the benchmark among all the Sino French JVs

The solution

Chongqing Sino French Water decided to work with Siveco to implement the bluebee® solution to meet its inspection needs. bluebee® is an off-the-shelf, well-proven Maintenance 4.0 software package, unlike most self-developed applications found in the market. The coverage of the project included the 4 subsidiary plants and 30 pumping stations in the water supply network. The project required

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> We got rid of pen and paper and it is fun to use bluebee® while working.

46 mobiles phones (20 for plant maintenance, 24 for inspection and the rest for pump stations) and 1,200 QR-coded tags corresponding to 1,200 inspection areas. The total number of people using bluebee® is 88. The project started in January 2015.

To reach World Class Maintenance, the new inspection process was defined based on ISO 55000 Asset management, involving inspection strategy and policy, organization, equipment coding, job coding, job description, job type, job frequency, actions, action types, scan QR codes etc. Measurements were standardized as well in terms of temperature, vibration, pressure and normal values were defined. This was documented in the "Core Model".

Beyond traditional inspection tools, the bluebee® app allows users to create Work Orders and Job Requests once a problem is detected onsite. The technical know-how database is made available to field users for diagnosis and decision support. Through 4G network, the mobile phones can automatically synchronize data with the Coswin back-office system.

bluebee® app: WO list, WO, diagnosis, action list

The app was configured based on the Core Model. Considering the complex working environment and existing working habits, several tests were conducted to ensure smooth handover. The project officially went live in August 2015.

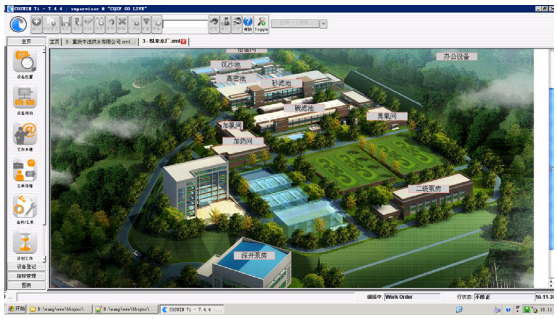
End users training

The benefits

Chongqing Sino French immediately obtained reports and KPIs to measure results and progress, which was not possible with the previous management model:

- Measurements over safe value
- Meters trends
- Abnormal failures analysis
- Comprehensive inspection analysis
- Unfinished job analysis

The bluebee® project improves field inspection through SOP and systematic analysis. One stone, two birds: it also optimizes the usage of the existing CMMS system, ensuring greater ROI. The project also contributes to higher safety, always the top priority for Sino French Water.



Friendly user interface to access management and analysis reports

According to Wang Zhibing, Chongqing Sino French Water's Production Leader: "We got rid of pen and paper and it is fun to use bluebee® while working. "

Luo Feng, the company's Operation Manager, added: "The bluebee® project improves our inspection process, while ensuring the safety of our operations."

The introduction of "Maintenance 4.0" and more generally "Industry 4.0", corresponds to the "New Normal" phase of China's development. It requires the combination of new Internet technologies and industrial know-how. As a pioneer, Chongqing Sino French Water took the first steps to adopt this concept into day-to-day practice. The project not only motivated workers but also demonstrated the value of their work and their capacity for innovation.

Based on the inspection Core Model established in Chongqing, bluebee® is being duplicated to the other Sino French Water JVs.

Lifecycle support for Hanas New Energy LNG Plant

Hanas New Energy LNG Plant

China's Hanas New Energy is one of the world's diversified energy solutions providers. Hanas New Energy's core business is the provision of wind power, solar-thermal power and distributed energy. The Group also delivers production of LNG (Liquefied Natural Gas), CCHP (Combined Cooling, Heating and Power), urban gas operation, and centralized natural gas heating and cooling. Hanas New Energy is promoting China's energy transformation.

Hanas New Energy owns and operates the largest LNG Plant in China with a production capacity of nearly 1 million tons per year. The plant liquefies natural gas from the CNPC West-East pipeline, using the APCI liquefaction process with a single mixed refrigerant (SMR) in two parallel liquefaction trains. LNG produced is stored in a 50,000 m3 tank and exported by trucks from the terminal.

Implementing the CMMS before plant start-up

In line with international best practices, a Computerized Maintenance Management System (CMMS) was implemented during the construction of the plant (2009-2011). Siveco has over the years refined this practice to meet the demands of Chinese projects, where as-built documentation is difficult to obtain and operators lack experience of modern maintenance practices. Hanas New Energy consequently selected Siveco and its "Coswin" CMMS.

Siveco maintenance specialists worked alongside the EPC and Hanas New Energy engineering team until plant start-up in early 2012, thus ensuring smooth transfer of technical documentation from construction to operation, supporting plant start-up with an accurate technical database and enforcing good maintenance practice from day one.

Efficient work management

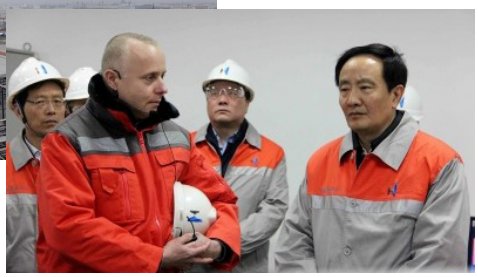
Once the LNG plant was put in operation, the CMMS served as the single repository for all maintenance, inspection and testing information. Work planning is done in Coswin, ensuring greater work efficiency and control over the most important aspects of the process.

According to Plant Manager Dietrich Roeben:

> "The CMMS ensures most efficient work turnaround for all preventive and corrective maintenance, inspection, testing and plant modifications. The CMMS also plays a role in effective risk management, which is crucial to our operation, aiming at zero harm to people and environment, surpassing regulatory requirements."

Five years later

Years later, the Siveco team continues to support Hanas New Energy LNG Plant with regular training and coaching, as well as support. Coswin stock management module was also put into use in March 2016.



Plant visit by the governor of Ningxia Hui Autonomous Region

In the word of the Plant Manager: "In spite of inevitable personnel changes since the plant started, the CMMS and support from Siveco has remained strong, ensuring true lifecycle support and continuous improvement for our plant."

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Enabling BIM for Lifecycle Management with bluebee® cloud for Revit®

BIM (Building Information Modelling) is fast becoming mandatory in large buildings and infrastructure projects, yet its actual usage for operation and maintenance remains an open question. In the process industry, 3D plant design has a long history but is usually not linked to maintenance. In early 2016, Siveco released its standard integration module bluebee® cloud for Revit®, as part of the company's Maintenance 4.0 suite.

O&M data preparation during construction

During construction, bluebee® cloud with Revit® integration acts as the maintenance data collection platform, compliant with all relevant standards such as LOD 500, COBie, PAS 1192, BS 1192, ISO 55000, EN 15331, ISO/TS 16952, IEC 81346, EN 13460 and ISO 14224, etc. The system is used to prepare and upload O&M data, linked to the Revit® BIM model. Data preparation progress is monitored through KPIs. All data can be accessed, with a 3D viewer embedded in the bluebee® portal.

BIM support for operations

In the Operation & Maintenance phase, maintenance teams either in-house or outsourced, can always access all related data in a very friendly manner. If the maintenance provider is using another CMMS, all data required by this system can be uploaded directly from bluebee® cloud. Alternatively, bluebee® cloud can be extended into operations, providing a day-to-day maintenance tool based on the ISO 55000 Asset Management standard. Technicians are equipped with bluebee® mobiles (any Android device) to conduct their daily work. As a result, the BIM database is kept "alive" throughout the building lifecycle, enabling true "BIM for lifecycle".

A standard module

This standard module is based on existing integration tools and the HMI integration concept that Siveco has popularized since the mid-2000s, already used for DCS/SCADA or GIS interfaces. The solution was developed at the Siveco China R&D Center in Shanghai. It has already been implemented for client projects such as China National Offshore Oil Corporation CNOOC and was prominently showcased at the Autodesk University China 2016, where WSP | Parsons Brinckerhoff, one of the world's largest engineering firm, presented Siveco's bluebee® solution. The same solution is used during the construction of various waste & water projects of environmental giant Suez in China and at the 530 meter-high Tianjin Chow Tai Fook Finance Centre.

The CNOOC experience

In December 2015, Chinese offshore oil giant CNOOC selected Siveco to deliver its Facilities Management cloud and mobile platform bluebee®, integrated with BIM models in Revit format. The system enables advanced work preparation, using data and graphics from the model to assess step-by-step work instructions and safety points.

> According to Zhang Rui, CNNOC's project manager: "This project, CNOOC's first application of BIM technology in property management, provides an effective tool to achieve visual management on building assets. BIM data is used in operation, in a centralized platform, to create a visual Asset Integrity Management platform."

Beijing Capital selects Siveco for ISO 55000 asset management consulting

Leading Chinese urban environmental service company Beijing Capital Co., Ltd. has selected Siveco to deliver integrated maintenance consulting services. Starting with a pilot at Yuyao Capital Water company (Zhejiang province), the project aims at establishing an overall asset management system based on advanced management concepts and the ISO 55000 international standard in order to further enhance Capital Group's reliable service to municipalities across China.

On October 24th, a ceremony was held with top managers of Capital Water to mark the official kick-off of the "Maintenance 4.0" asset management project in Yuyao. The kick-off was followed by an initial ISO 55000

training, conducted by Siveco Operations Director Guillaume Gimonet and Project Manager Yang Sen.

Deputy Manager of Operation Department, Wang Guanghui said at the meeting: "Through the cooperation with Siveco, we aim to establish a new benchmark for maintenance management in the Chinese water industry, strengthen preventive maintenance, reduce breakdown maintenance, optimize equipment lifecycle cost, improve overall maintenance management efficiency and establish a modern equipment management system with self-characteristics, in order to leapfrog the development of maintenance management and thus achieve the overall strategic ambition of company."

Scan to know more about this meeting from Yuyao Water's own WeChat account

Baosteel Gases wins prize for Coswin 8i multisite CMMS project

The EMM team of Baosteel Gases won the 2016 Prize for Outstanding Contribution by Baosteel Science and Technology Association for this project.

Baosteel Gases, a leading Chinese gas utility has selected Siveco to implement its CMMS Coswin 8i and provide maintenance consulting services. The company operates air separation, syngas, hydrogen production plants nationwide, as well as clean energy projects. The project aims at strengthening the company's reliability and maintenance excellence program. The project started in April 2016. Its first phase, aimed at establishing a maintenance "core model" with guidelines applicable to all sites, was completed in June.

On July 28, an official ceremony marked the "Go Live" of Baosteel Gases' Excellent Maintenance Management (EMM) system, based on Siveco's Coswin 8i, on the pilot site of Hefei, Anhui province.

During the ceremony, Baosteel Gases Operation Director Yan Wei gave a speech, followed by Siveco's Vice General Manager Paul Wang and Project Manager Rob Qiu. Finally, Director Yan created the first official Work Order in Coswin 8i and pronounced the EMM "Live".

Based on this successful pilot in Hefei, Coswin 8i is quickly spreading to the other seven sites of Baosteel Gases. In addition, both companies are discussing the implementation of the bluebee® mobile solution later this year.

Siveco was selected through competitive bidding among other international CMMS suppliers. Siveco was chosen for its in-house maintenance consulting capability and its successful track record providing similar services to other multisite utility companies in China. Siveco utility clients in the country include joint-ventures of Suez Group (waste and water), Beijing Enterprises Environment Group (waste), Engie (cogeneration), Shell (oil storage), etc. Siveco also works with Chinese and Korean EPC companies building power plants all over the world.

Welcome to Maintenance 4.0

Siveco China, founded in 2004, is the country's largest maintenance consultancy and a pioneer in the development of Maintenance 4.0 technologies, with a focus on mobile solutions "for the worker of tomorrow". Rather than replicating a western model, Siveco is designing new solutions to address the needs of maintenance "with Chinese characteristics".

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