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EMERGENCY REPORT



EMERGENCY REPORT

MONTHLY SUMMARISED REPORT

Remote fleet monitoring

[Construction Machinery] × [ICT Solutions] ²

ConSite
Consolidated Solution for Construction Sites

Global Expansion

 Hitachi Construction Machinery Group

ConSite

Consolidated Solution for Construction Sites

Global Expansion

ConSite services were introduced in Japan on October 2013, with further deployment to other countries from April 2014. By the end of the same fiscal year, there were 1,299 machines contracted to ConSite. Two years later, the ConSite service was available for over 35,691 machines globally. This is 8.3 times more than the forecast.

Yes! In just two years the result had exceeded more than initial projections. We believe that this is the right time to answer one fundamental question: Why is ConSite being adopted so rapidly worldwide? Let's dive together and look at the secret of ConSite's global expansion.

* Contracts established for approximately 30% of the total of 117,439 ConSite potential machines.

Author / Satoru Sato Photographer / (personnel) Shinya Kojima



Hitachi Way! Win-Win for Customers and Dealers

“The vision of Hitachi Construction Machinery serves as a framework for ConSite roadmap and guides every aspect of our direction and strategies to continue achieving sustainable quality growth. We believe that customers with a strong focus on machinery maintenance and their management heavily interested in ICT are the primary target users of ConSite.” Yoshiya Hamamachi, General Manager of ConSite Development and Promotion Department in Life Cycle Support Operations Group.

ConSite was launched in Japan on October 2013, with test operation and service delivery commencing globally in 2014. The service far exceeded the expectations of Hamamachi and his team. Initially, ConSite Team projected 4,300 machines to be covered with ConSite contract by the end of fiscal year 2015. The actual number of contracts was over 35,691 which is 8.3 times more than the forecast.

Obviously, there were reasons for these tremendous performances. According to the “Innovator Theory”, for a new product to achieve rapid growth, it needs to gain a market penetration of roughly 15%. Hamamachi and his team expected this would take four to five years from the launch date. But in reality, Hamamachi explains: “It appears to have been a great deal of latent need among customers for more efficient machine operation.”

Of course, it was Hamamachi’s team’s efforts that made it possible to realize these latent needs.

ConSite is a service program developed out of the Global e-Service, which uses machine operation status information, positioning information and the like, obtained from sensors in Hitachi Construction Machinery hydraulic excavators, wheel loaders, and other machinery, transmitted via a communication system, to perform remote management. Warranty contents and maintenance contents can be customized to fit customer needs on an individual construction machine basis. The driver of the tremendous service expansion, however, has been the data report service. This service automatically transmits machine operating conditions and faults in a report format to email addresses registered by the customer.

The data report service can be used to



Life Cycle Support Operations Group
Customer Support Division ConSite Development & Promotion Department
General Manager

Yoshiya Hamamachi

analyze various operating conditions, such as daily operation time, fuel usage, monthly operating oil temperatures, swing ratios, idle time, and more. This information is presented in Monthly Report using graphs and charts that provide easy to understand monthly overviews, and Alarm Reports, which report urgent alarms which could result in machine failure.

ConSite Monthly Report includes not only operation data, but also improve-

ment suggestions automatically generated as based on trend analysis and engine operation time forecasts for the following year, assisting with maintenance cost reduction and maintenance planning. This helps keep machine asset values high.

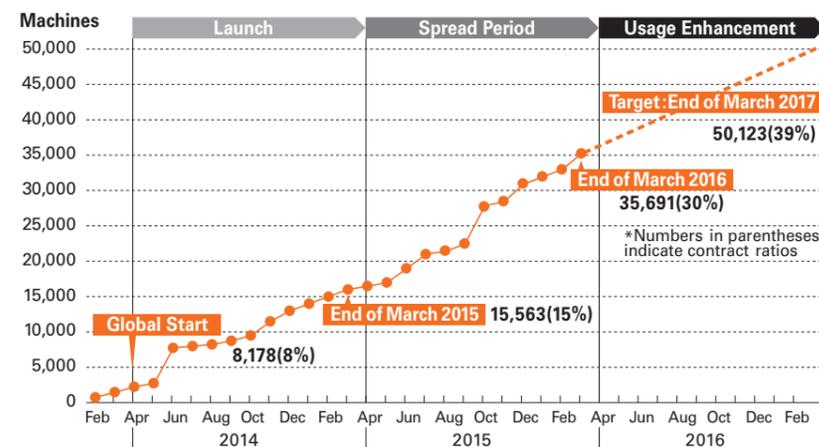
When issues are detected, ConSite Alarm Reports are sent to multiple addresses registered by the customer, making it possible for management staff to be aware of construction machinery problems even when not on-site.

This information is also sent to dealers to address problems quickly by sharing construction machinery status between dealers and customers.

Basically, a customer that encountered a problem would call their dealer, and the dealer would send service personnel on-site to confirm the situation. When a malfunction was discovered, the dealer would arrange for replacement parts, and once the parts were ready, they would finally begin repairs.

With ConSite, on the other hand, the dealer can bring up emergency response measures using links in the Hitachi Construction Machinery database tied to the Alarm Report. This helps minimize machine downtime, enables even service personnel with little experience to rapidly and accurately handle problems, and makes it possible to provide a consistently high level of service quality around the world, without regional disparities. This service provides tremendous advantages to customers and dealers alike.

Number of Machines with ConSite Contracts



ConSite contract numbers continue to grow beyond expectations. Full-fledged deployment has started in developed countries and regions such as Japan, Europe, and Oceania, and in emerging countries such as China, Turkey, Kazakhstan, Kenya, South Africa, Thailand, Malaysia, and Indonesia. Customers in Europe including the U.K., Asia, and Oceania are especially interested in fuel consumption monitoring.

“Machine downtime among customers who have deployed ConSite has consistently gone down,” explains Hamamachi. “The service has also been well-received by dealers, who have praised the simple and easy to understand handling procedures and the response speed it makes possible.”

From Operational Focused to Customer Centric

Customers around the world are about to transform with many potentially disruptive changes coming faster than anticipated, but there is a healthy optimism from ConSite about what lies ahead. At ConSite, opportunities for both growth and margin increase can be seen. Shift in mindset and focus are required to be successful with these. Shifting from an operations-focused to a customer-centric perspective is a major step in a right direction. This shift needs to be translated into strategic choices, concrete actions, and visible changes in the daily business. By acting urgently and decisively, utilization of ConSite have a great prospect in the years to come.

Hamamachi points out another reason for the exponential growth of ConSite services. “Basically, sales and service personnel visit customer sites. However, it is very challenging to conduct frequent visits when it comes to remote locations. ConSite is definitely the key solution that creates a bridge between us and customers. Automatically, the customers with ConSite contracts can receive a Monthly Report in a regular basis which enhances the information sharing. Dealers also

used the operating status information in Monthly Report to make various proposals and creating service packages. These bring the customers closer to us.”

“Customers have gone beyond just being interested in machine performance and initial investment to being interested in overall lifecycle cost reduction. New vehicle demand has fallen worldwide, so local dealers were also beginning to focus on parts sales and services. This created the ideal environment for ConSite, which was easy to deploy for both customers and dealers.”

This system, in which reports are delivered automatically to customers each month, is one of the core elements of ConSite and is made possible by the comprehensive technical strengths of the Hitachi Group.

Other companies also offer ICT-based data report services, but their services require customers to log into dedicated websites each time they wish to check data, and manually perform data collection and trend determination. This is time-consuming and requires IT skills. ConSite, on the other hand, was designed to be automated from the start. The entire process, from data collection to analysis, processing, and reporting to customers, is automated. Because it does not involve manual operations, it is speedy, and does not inconvenience dealers or customers. These functions, unparalleled by competitors, were made possible by the Hitachi Group’s data science and big data analysis technologies.

The most difficult aspect was determining abnormal values. Sending erroneous emergency reports would disturb worksites. Failing to report on actual faults would inevitably result in machine failures. The precision in which the system identifies faults is provided by an intelligence filter designed by the Hitachi Group. This identification logic in computers mounted in construction machinery and large amounts of operational data acquired from other construction machinery undergo statistical analysis to determine appropriate error values for the construction machinery in question. Of the 36 emergency reports issued in Japan as of the service launch in 2013, there have been 0 erroneous reports. In the future, we plan to expand from manifest risks which take the form of alarms to predictive diagnosis, identifying latent risks by expanding the range of faults detection patterns used.

ConSite Localization

Hamamachi and his ConSite team certainly believe that in order to attain significant market share, ConSite services must be fully localized in the languages of target countries. It is a vital process of adapting ConSite to various markets worldwide for local customers to feel that ConSite services was planned and developed for them and is adapted to their language, culture, and needs.

Also, Hamamachi explained, while language localization is performed by translating from Japanese into English and then from English into the local languages, the first step was “translating from Japanese into Japanese.” What does that entail?

“Japanese itself is often a vague language, so once you translate it into English, there’s a limit to what you can do to correct it. In order to completely eliminate errors and vagueness, first we translated the Japanese in the report into Japanese which would be easier to translate into English.”

A single translation project could involve almost 20 steps.

“It is important to understand that the opportunity of penetrating country’s market usually presents itself only once. Therefore, we highly consider the quality of ConSite’s language localization to be its greatest advantages. In the future, we will deploy automated translation technology for the initial translations. This is going to help us achieve even greater translation speed and precision.”

There are now ConSite contracts in 29 countries and regions around the world. ConSite is available in 32 languages, and in the future it will be rolled out to 42 countries and regions (target for end of fiscal 2016 = Contracts for approximately 50,000 machines, establishing contracts for approximately 40% of all ConSite potential machines).

What’s next?

As penetration rates rise, customer and dealer interest are shifting towards lowering lifecycle costs and monitor machine conditions to proposing new services which assist with preventive maintenance.

“Customers are looking forward to what kinds of proposals dealers can provide based on these reports. There have already been numerous successful examples in dealers worldwide, and we also need to focus on remaining dealers that

List of ConSite deployment areas, contract conditions, and supported localized languages

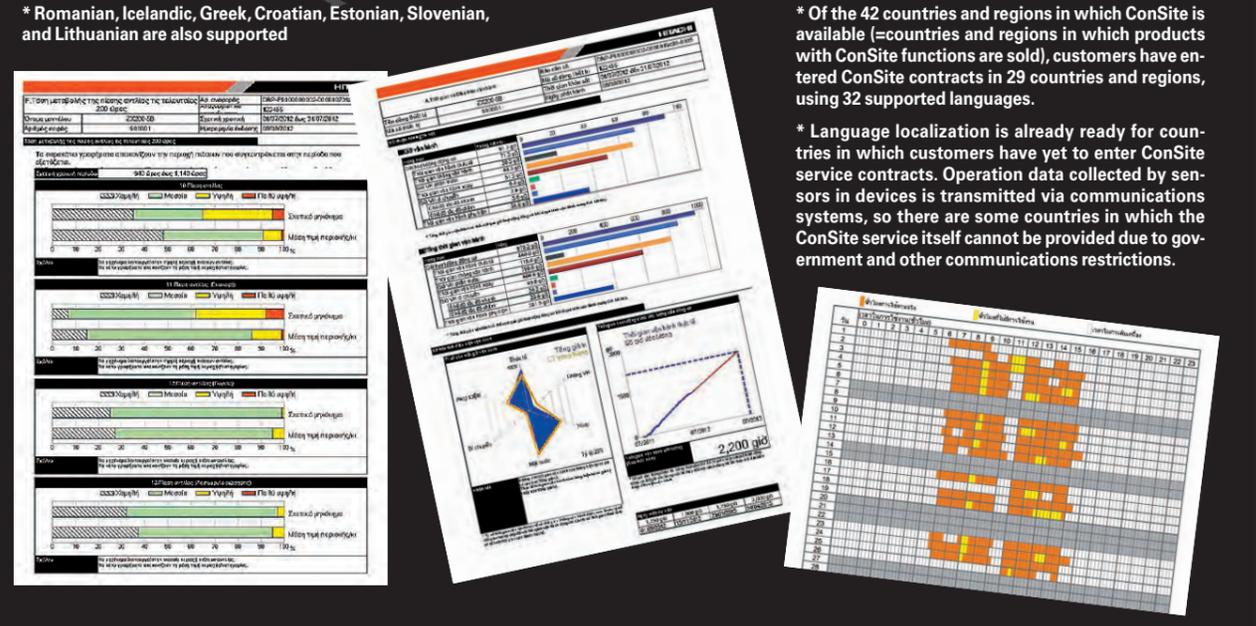
Current as of end of April 2016

ConSite deployment countries and regions	Contract conditions	Supported localized languages	ConSite deployment countries and regions	Contract conditions	Supported localized languages
Japan	○	Japanese	Denmark	○	Danish
Malaysia	○	English, Malaysian	Switzerland	—	German, French, Italian
Thailand	○	Thai	Bulgaria	—	Bulgarian
Indonesia	○	Indonesian	France	○	French
Philippines	○	English	South Africa	○	English
Vietnam	○	Vietnamese	Zambia	—	English
Australia	○	English	Botswana	○	English
New Zealand	○	English	Turkey	○	Turkish
Sweden	○	Swedish	Saudi Arabia	○	Arabic
Netherlands	○	Dutch	Iraq	—	Arabic
England	○	English	Kenya	○	English
Germany	—	German	Kuwait	○	Arabic
Belgium	○	Dutch, French	Qatar	○	Arabic
Norway	○	Norwegian	Bahrain	○	Arabic
Finland	○	Finnish	Russia	○	Russian
Italy	○	Italian	Kazakhstan	○	Russian
Israel	—	Arabic, Hebrew	Belarus	—	Russian
Portugal	—	Portuguese	Ukraine	—	Russian
Poland	—	Polish	China	○	Chinese
Northeastern Africa	—	English	Taiwan	○	Taiwanese
Spain	—	Spanish	India	—	Hindi, English

* Romanian, Icelandic, Greek, Croatian, Estonian, Slovenian, and Lithuanian are also supported

* Of the 42 countries and regions in which ConSite is available (=countries and regions in which products with ConSite functions are sold), customers have entered ConSite contracts in 29 countries and regions, using 32 supported languages.

* Language localization is already ready for countries in which customers have yet to enter ConSite service contracts. Operation data collected by sensors in devices is transmitted via communications systems, so there are some countries in which the ConSite service itself cannot be provided due to government and other communications restrictions.



are not fully aware on the report usage.”

Hamamachi emphasizes that improving the proposal strengths of dealers will be a major topic going forward.

“What customers expect from us are overwhelming proposal strengths that look at entire lifecycles. To achieve this, dealers need to constantly produce concrete ideas they can propose to customers. They need to further improve the quality of communications and use cus-

tomers feedback and ideas even more in new model development. I hope we can further broaden the scope of our proposals, both in the areas of services and product development.

We will use the Hitachi Group’s AI and data science to further enhance ConSite, continuing to make great strides so that we can issue accurate proposals to our customers around the globe. ConSite still possesses tremendous potential.”

ConSite

Consolidated Solution for Construction Sites

World Evaluation

UK

Knowledge at your fingertips, assisting with operation status analysis, operator training, and management decision-making

The Hampshire-based TJ Group specializes in waste management, recycling and transport. It has a fleet of five Hitachi medium excavators and four wheel loaders working across several sites in southern England. The TJ Group was introduced to ConSite almost two years ago by HCM (UK), and deployed the service inside the UK soon after its launch. Managing Director John Gosling says, "ConSite brings a cost benefit, so it affects our purchase decision. ConSite means lower running costs over the lifetime of each Hitachi machine."

The amount of data in the Monthly Report can be customized according to



The previous month's working hours for the ZX130LCN-5 are highlighted

individual requirements, but Gosling prefers to access all that is available.

"It builds a database, so we can learn more about our equipment and operation. And it's available at the push of a button, for health and safety, maintenance and budgeting purposes. From a budgetary point of view, we need to predict when the next service is due, and when we need to replace our fleet."

Gosling assesses operation hours, idling time, coolant water temperatures, operation oil temperatures, fuel consumption, CO2 emissions, and other data to make comprehensive evaluations and determine the value of individual machines.

"The hours are useful because equal utilization of machines across the fleet is important in terms of depreciation. One site might have two machines and the operators might favor using one over another, which means one model is clocking up more hours. The hours also show how busy a particular site is. So perhaps we need to swap machines to other sites, look at staffing levels, and check if we have the right model working there."

Monitoring fuel consumption is also vital for the TJ Group, which has a fleet of 140 trucks for its transport business.

"We have always focused on the fuel efficiency of our lorries, and now thanks to ConSite, we can focus on the fuel efficiency of our construction machinery too. Previously, we had to estimate fuel, but now we can accurately predict it," says Gosling.

They can also check the amount of remaining fuel levels at the end of each day, making it possible to optimally time refueling without making trucks wait, further improving work efficiency.

The company's employees fill in time sheets for both hours and fuel used, which can be checked against the ConSite report. This has also had a positive effect.

"They are becoming more diligent in filling out time sheets and how they use the machines. We're also now encouraging our operators to use the Hitachi fleet more efficiently."

ConSite's efficiency improvements are evident at one of the company's indoor recycling facilities in Tipner, Portsmouth. Approximately 130 trucks visit the site per day, where a ZX130LCN-5 and ZX85US-5 are used to sort mixed waste materials six days a week. The ZX85US-5 loads a hopper that transfers waste, and the ZX130LCN-5 is fitted with a grab attachment to select materials for separate stockpiles by waste type.

According to the latest ConSite report, the ZX130LCN-5 has a 20% non-operation ratio, well below the UK average, and an exceptionally efficient idling ratio. The swing ratio, fuel economy, operating and idling time are among the variables that Operations Manager Jason Strudwick checks on the ConSite report.

"I want to find out more about the usage of each machine, and try to find the most effective way for them to operate. I love ConSite. At the click of a button, I know what each machine has done that month. We have the knowledge at our fingertips, and it helps to provide training for operators, assisting us in becoming more efficient."



Operation data is easy to monitor on the job site or in the office



TJ Group Managing Director John Gosling



Using ConSite has helped the TJ Group to enhance the efficiency of its Hitachi fleet

India

Using Monthly Report figures to identify problems and propose worksite improvements for increasing productivity



Service personnel offering improvement proposals to the customer based on data from Monthly Reports



Operation before improvement: 180 degrees of swing required between excavation and loading (left) Operation after improvement: Swing reduced to just 60 degrees (right)

ConSite Monthly Report, which is automatically delivered every month, provide customers with valuable information, while at the same time on the service end, presenting opportunities for improvement proposals based on the reports.

Aiswarya Granites, a customer in the Indian state of Kerala, has deployed ConSite for its two ZX220-GIs.

One day, a Tata Hitachi staff member looking at the Monthly Report for the previous month, which indicated the machines' operating conditions, noticed that the swing ratios and idling times for the machines were high. Together with a staff member from the local dealer, they went on-site and investigated the cause of the high figures in the Monthly Report. They found that a great deal of swing work was involved in loading the dump truck, and there were various factors that contributed to a large amount of idling. They issued a proposal that would minimize the swing angle used when loading the dump truck.

This reduced the 180 degree swing angle which had taken 143 seconds, to just 60 degrees shortening the process to 113 seconds and improving operation efficiency by 21%. They also presented the company president, Chakochoan, with further proposals for reducing costs through worksite improvements, such as the use of eco mode operation and reducing the idling time. The next month's report showed clear improvements as the result of these proposals.

"The customer was surprised by the results. This led to them asking us to provide training to worksite staff, and we discussed operation methods for improving swing operation and reducing idling time. President Chakochoan also created incentives for teams that achieved actual operation improvements, improving their motivation. This contributed to further fuel consumption reductions, and the deployment of a new construction machine," explains Tata Hitachi Service Manager Linoy.

ConSite created a win-win relationship by cutting expenses for the customer, leading to the creation of an incentive system for operators, and resulting in new machine sales for the dealer.

South Africa

Rapidly implementing measures by coordinating information between the headquarters, branch, and customer

"Not only does ConSite make it possible to implement measures in advance, it also enables a high level of machine maintenance. We are extremely pleased with it, and with the support offered by the Durban branch," says site manager Justin Habanya of HENNOX, a manufacturer, distributor, and collector of large shipping and bulk materials.

The company operates hydraulic excavators in its shipyard in Richards Bay, in the northeast of Durban, South Africa. The hydraulic excavators operate 24 hours a day, loading iron ore.

One day, an Alarm Report was issued indicating that one of the hydraulic excavators had overheated. Service personnel from Hitachi Construction Machinery Africa's Durban branch immediately notified the customer and requested the

implementation of overheating countermeasures, such as radiator cleaning. At the same time, the Hitachi Construction Machinery Africa headquarters remotely confirmed that the cooling water had remained stable for the past few days, but had suddenly risen before the overheating. It determined that the overheating was caused by an electrical fault in a component such as the overheat switch or wiring harness, and informed the service personnel. When the service personnel arrived on site, they discovered that the main cause of the outage was dirty connectors. After cleaning all of the connectors, the equipment began functioning as normal again. The work performed on-site created a large amount of dust, and the salt in the air from the nearby port created an environment conducive to salt damage. These factors contributed to connectors becoming dirty and corroded. "Thanks to the Alarm Reports," said Habanya, "we can solve problems correctly right from the start. The Monthly Report also help us create maintenance plans, minimizing idle time and improving productivity."

ConSite enables the headquarters, branch, and customer to share informa-



ZX200-5Gs are used in the shipyard located alongside Richards Bay. All six of the company's hydraulic excavators are made by Hitachi.

tion immediately, coordinating as they implement measures. This makes it possible for service personnel to accurately predict what measures they will need to implement before they even arrive on-site.