Hitachi Power Solutions Adds New "Failure Cause Estimation" and "Predictive Services"

-- Supporting the stable operation of machinery, maintenance of quality and improvement in production efficiency through the sophistication of predictive diagnostics --

Tokyo, March 15, 2017 - Hitachi Power Solutions Co., Ltd. (Hitachi Power Solutions), a wholly owned subsidiary of Hitachi, Ltd.(TSE: 6501), today announced that it is adding new "Failure cause estimation" and "Predictive services" to its operated services using the original predictive diagnostics system. The new failure cause estimation service provides information useful for identifying the location of faults by checking past fault history and relevant sensor data against machinery prediction data, while the new failure predictive service estimates the length of time machinery can continue to operate from trends in predictive diagnostics data. Hitachi Power Solutions plans to start providing the new services from April 2017.

In recent years, attempts to monitor the status of equipment based on data collected from sensors fitted to the equipment to prevent unexpected downtime due to machinery failure, thus improving the utilization of equipment and reducing maintenance costs, have become more widespread. In particular, machinery maintenance needs have changed from regular maintenance as the mainstream approach to prevention of failure through the detection of changes in machinery status in advance, and sophisticated maintenance technologies using predictive diagnostics results and information about machinery maintenance operations are required.

Hitachi Power Solutions has developed systems that combine Hitachi's knowhow of maintenance services for various industrial machinery with data mining technology accumulated in the IT sector, such as the predictive diagnostics system that helps prevent unexpected downtime and the system that enables predictive diagnosis in the edge computing environment as an industry pioneer. Using these systems, Hitachi Power Solutions has provided services for predicting machinery failure.

To meet changing machinery maintenance needs, Hitachi Power Solutions has now added new "Failure cause estimation" and "Predictive services", effectively using the data gathered from machinery and its knowledge of maintenance operations. By providing these to customers as new functions of the predictive diagnostics service, Hitachi Power Solutions will make it possible to deal with machinery malfunction more efficiently and draw up plans

for dealing with unexpected downtime. These services will be used accumulate data and perform diagnostics on an ongoing basis, leading to the identification of new issues and the provision of services to resolve these new issues in a process of collaborative creation with customers.

Hitachi Power Solutions possesses considerable know-how relating to machinery and its care and maintenance, having since its foundation operated service businesses for industry, IT, and other forms of social infrastructure, especially electric power and energy. This includes the predictive diagnostics system, launched in June 2013, which monitors machinery to prevent unanticipated downtime with ICT and Data mining[1] technology. The predictive diagnostics system is one of applications of Hitachi's Lumada IoT platform. In June, 2016, Hitachi Power Solutions developed the predictive diagnosis system for the edge computing environment by porting predictive diagnosis engine (including the learning function) to IoT (Internet of Things) gateway [2] of Eurotech Corporation which was a partner of Hitachi Insight Group.

Hitachi Power Solutions aims to pursue strategic global expansion by providing services based on the predictive diagnostics system, thus expanding the predictive diagnostics solutions business.

(1) Data mining: A multi-variable data analysis technique for the extraction (mining) of new knowledge by the mathematical analysis of large quantities of data
(2) Gateway: A device that has functions for forwarding data collected from connected equipment or sensors to a server

■**About the "Failure cause estimation" and "Predictive services"**
1. Cause estimation function
   Information such as records of measures taken to deal with failure in the past and maintenance records and information from sensors in locations where malfunctions were detected is registered in the system, and the new function supports estimation of the cause of failure by searching for similar information based on correlations with sensors, etc. and displaying information that is effective for identifying the location of the failure.
2. Predictive failure function
   The new function presents trends in machinery status based on past diagnostics data in the form of a graph and estimates the length of time the machinery can continue to operate, thus predicting when failure will occur. The new function can also predict how long machinery can continue to operate normally based on parameter settings.

■**Predictive diagnostics service menu**

1. System introduction support

Hitachi Power Solutions will support introduction of the predictive diagnostics system to increase its effectiveness.

①　Evaluation of system effectiveness: Evaluation of suitability of predictive diagnostics system based on sample data.

②　PoC[3] : Connection of predictive diagnostics system to actual machinery and verification of problems for practical application, followed by selection of suitable diagnostics engine and proposal of optimal system configuration.

③　Support prior to system operation : Development of user environment and customization of system, etc. in preparation for actual operation.

2. Predictive diagnostics service

①　Display of failure predictive diagnostics results： Analysis of sensor data, display of any data that is different from normal operation, and visualization of the extent of malfunction. Display of sensors with a high impact on failure and display of fluctuation in the data from these sensors in the form of a graph.

②　Automatic updating of data learned about normal operation: Updating of data acquired about normal operation from the latest operation data whilst machinery is in operation. This enables operation that takes changes in machinery status due to aging and environmental changes due to seasonal factors into consideration and supports the optimization of maintenance measures.

3. Support for stable operation

①　Diagnosis of suitability of data acquired about normal operation through regular visits by system engineer (once per period).

②　Dealing with e-mail and telephone inquiries (weekdays 9:00 to 17:00).

(3)PoC: Proof of Concept

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■**Hitachi Power Solutions website**

http://www.hitachi-power-solutions.com/en/index.html

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