

GS 36J40B10-01EN

■ PROBLEM

Safety and environmental protection are important factors when operating subsea systems. Valve degradation is one of the key areas of influence and has the potential to effect the performance of these underwater systems. Changing valve characteristics over time, can impact the operations, efficiency and safety of subsea systems. Forewarning operators of any possible issues is critical. This is achievable with access to continuously updated valve information and associated data captured by the subsea system including Downhole Pressure & Temperature (DHPT) and Acoustic Sand Detector (ASD) to help isolate problems.

■ SOLUTION

Exaquantum Subsea Historian (Exaquantum/SSH) collects data to assist the early identification of valve degradation and dangerous process conditions. Operators can quickly isolate problems and take corrective actions before production and performance is impacted.

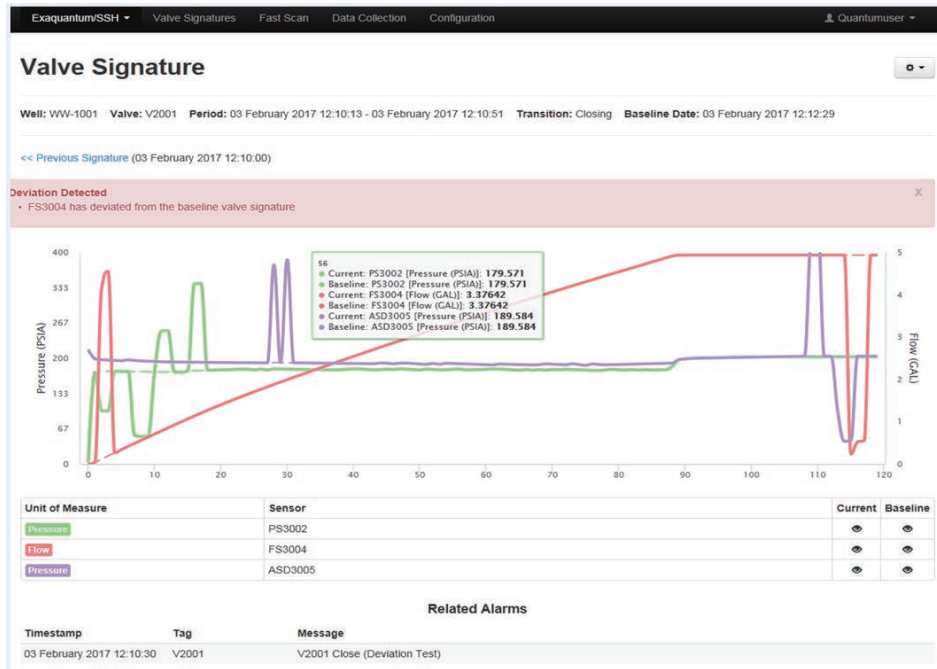
Through the continuous monitoring of data generated by the subsea system, unexpected operational issues can be reduced, providing a continuous health check of the subsea system.

By integrating within a Yokogawa DCS, operators can view valve information on HIS (Human Interface Station) screens in the control room with alarm notifications displayed alongside valve signatures, highlighting any abnormal valve operations. Users can also quickly access Fast Scan pages that displays DHPT, ASD and valve operating conditions for enhanced evaluation and analysis.

Timestamp	Valve	Transition	State
06 February 2017 11:21:37	V2001	Close	Complete Deviated
06 February 2017 11:21:19	V2001	Open	Incomplete
06 February 2017 11:20:53	V2001	Open	Complete
06 February 2017 11:20:38	V2001	Close	Complete
03 February 2017 12:10:40	V2001	Open	Complete Deviated
03 February 2017 12:10:13	V2001	Close	Complete Deviated
03 February 2017 12:10:00	V2001	Close	Complete
03 February 2017 12:08:17	V2001	Close	Complete
03 February 2017 12:07:57	V2001	Open	Complete

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Figure 1: Exaquantum/SSH Valve Signature Screen



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BENEFITS

- Reduce risk by providing early warning and detection of valve degradation.
- Increased situational awareness allowing operators to react effectively to abnormal conditions.
- Reduce unexpected operational issues with a continuous health check of the subsea system.
- Improved maintenance programs.
- Enhanced decision support with unified access to information.

KEY FEATURES

- Valve signature data is displayed on trend charts with the associated baseline to show any deviations.
- Deviation alarms quickly alert operators to abnormal valve occurrences.
- Collects and stores all valve signatures in date and time order, displaying the most recent valve activations.
- Data can be filtered by wells, valves, transition types, time period and deviation status for quick selection.
- Fast Scan page provides a display of Downhole Pressure & Temperature (DHPT) and Acoustic Sand Detector (ASD) sensor data showing valve operating conditions.
- Continuously collects data from FMC Technologies subsea systems using the FMC722 communications protocol.
- Data can be collected for up to sixteen pairs of FMC Topside Processing Units (TPUs) by the SSH Data Collector Server and stored in Exaquantum PIMS.
- Data recovery is available following a service shutdown or lost connection to the SSH Data Collector Server.
- Determines the best sensor to use for valve data collection, including information from redundant sensors.
- SSH Data Collector Server has the ability to retrieve valve data directly from the FMC Data Historian if present.

CAPABILITIES

Safety & Environment Protection

- Identify early signs of valve degradation with visual display of signature deviations from the current baseline for every valve signature.
- By analyzing valve performance, operators are able to identify wear, drift and sticking valves that enables preventative maintenance before failure.
- Operators have insight into operational conditions with access to temperature, pressure and sand data which is time and date stamped.

Maintain Performance

- Navigate valve data quickly via filters to pinpoint areas of concern. When selecting a valve, the detailed view can help isolate valve problems rapidly and corrective actions taken to improve operational performance.
- By accessing data direct from the TPU, Exaquantum PIMS is used to reliably collect and store historical subsea system data.

Notification of Potential Issues

- Simplified monitoring and analysis of subsea data.
- Abnormal valve operation can trigger DCS alarms, alerting operators of issues on the HIS (Human Interface Stations) in the control room.
- Alarm notifications from the DCS are displayed alongside valve signature data for a more complete picture of valve activity.

Operational Monitoring

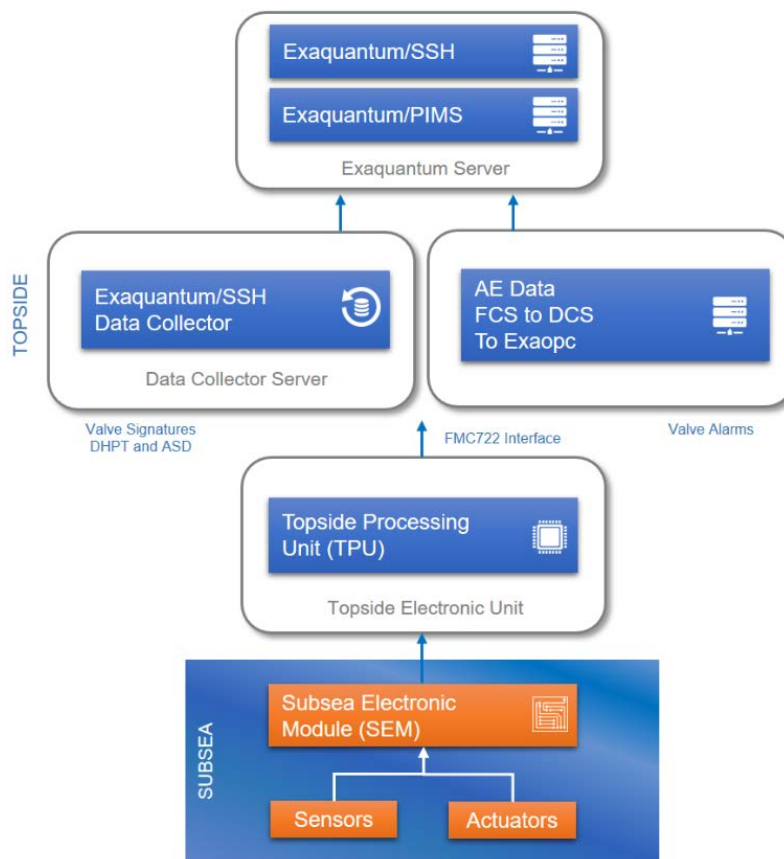
- Full listing of stored valve signatures that can be filtered by wells, valves, transition types, time period and deviation status to provide operators with analysis by intuitive selection.
- Trending and alarm displays providing analysis of valve signature data comparing conditions before and after the closing or opening of valves.
- View the current valve signature against a baseline for early detection of valve degradation.
- View of the selected valve signature with navigation to the previous or following signature of the same valve and type for continuous evaluation of valve performance.
- Deviation sensor alarm showing if a sensor has deviated from the baseline, alerting operators.
- Related alarms from the DCS are displayed alongside the valve signature page providing context for the operators
- Trending to provide analysis of DHPT and ASD data for enhanced evaluation and analysis.
- Valve signature and fast scan data can be exported to allow further analysis from third party applications
- Direct access to valve signatures list page or valve signature page through parametrized web query.

Data Recovery

- Data recovery between the Exaquantum Server and the SSH Data Collector Server is available following an Exaquantum Server service shutdown or following connection loss to the SSH Data Collector Server.
- Once the Exaquantum Server is available or network connection to the SSH Data Collector Server is restored, data will be automatically retrieved from the SSH Data Collector Server for the downtime period. Data recovery allows controlled down time of the Exaquantum Server without affecting data integrity.

Redundancy

- SSH system configuration allows configuration of redundancy in two scenarios.
- Configuration of two SSH Data Collector Servers – this allows automatic/manual fail over if a SSH Data Collector Server is not providing data to an acceptable level.
- Configuration of data quality assessment within the interface between the Exaquantum Server and the Data Collector Server (SSH or FMC) – This allows the underlying redundant sensor data to be assessed for quality with the best available values being stored within the Exaquantum Server



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■ INTERFACES

Interface to Topside Processing Unit (TPU)

Exaquantum/SSH interfaces to Topside Processing Units (TPUs) to collect Valve Signatures, Downhole Pressure & Temperature and Acoustic Sand Detection data. Alarms & Events are obtained from the DCS via OPC A&E.

SSH Data Collector – single or redundant server configuration providing data collection from the TPUs. Supports the FMC-722 interface.

SSH Data Server – installed on the Exaquantum Server. Performs deviation calculations and data collection from the SSH Data Collector Server.

SSH Web Server – installed on the Exaquantum Server or Exaquantum Web Server providing the user interface.

Interface to FMC Data Historian

Where sites use the FMC Data Historian instead of using the SSH Data Collector Server, the SSH Data Server has the ability to collect Valve Signature data directly from the FMC Data Historian.

■ HARDWARE AND SOFTWARE REQUIREMENTS

Minimum Hardware and Software Specifications

Component	Minimum Hardware and Software Specification
Exaquantum/SSH Server	<p>For detailed specification information, refer to the following description in "Exaquantum GS (GS 36J04A10-01E)."</p> <p>Hardware:</p> <ul style="list-style-type: none"> ● Hardware Operating Environment "Exaquantum Server" <p>Software:</p> <ul style="list-style-type: none"> ● Software Operating Environment "Exaquantum Server" <p>For detailed supported revision, please refer to "GS 36J40W10-01EN."</p>
Exaquantum/SSH Web Server	<p>For detailed specification information, refer to the following description in "Exaquantum GS (GS 36J04A10-01E)."</p> <p>Hardware:</p> <ul style="list-style-type: none"> ● Hardware Operating Environment "Web Server" <p>Software:</p> <ul style="list-style-type: none"> ● Software Operating Environment "Exaquantum Web Server" <p>For detailed supported revision, please refer to "GS 36J40W10-01EN."</p>
Exaquantum/SSH Web Clients	<p>For detailed specification information, refer to the following description in "Exaquantum GS (GS 36J04A10-01E)."</p> <p>Hardware:</p> <ul style="list-style-type: none"> ● Hardware Operating Environment "Exaquantum Use PCs" <p>Software:</p> <ul style="list-style-type: none"> ● Software Operating Environment "User PCs for Exaquantum/Explorer, Exaquantum/Web Client" <p>For detailed supported revision, please refer to "GS 36J40W10-01EN."</p>

If SSH will be installed on a different version of Exaquantum, please contact Yokogawa for assistance.

■ MODELS AND SUFFIX CODES

Exaquantum/SSH Product

		Description
Model	NTPC010	Exaquantum/SSH Product
Suffix Codes	-S	Basic Software License
	1	New Order (with Media)
	1	English version
	-SV□□ -YYYY	Enter the number of Exaquantum/SSH Server Licenses Select an Option Code
Option Codes	/WC□□	Enter the number of per-seat Exaquantum/SSH Web Client Licenses (1 - 99)
	/FMC□	Enter the number of FMC Historian Interface Licenses (1 - 9)
	/FDC□	Enter the number of FMC722 Data Collector Interface Licenses to one or more FMC TPUs (Topside Processing Units) (1 - 9)
	/FDR□	Enter the number of FMC722 Redundant Data Collector Interface Licenses to one or more redundant FMC TPUs (Topside Processing Unit) (1 - 9)
	/CAM□	Enter the number of Exaquantum/SSH Server Licenses to Interface to Cameron valve signature data files (1 - 9)
	/GEL□	Enter the number of Exaquantum/SSH Server Licenses to Interface to GE valve signature data files (1 - 9)

Maintenance Service for Exaquantum/SSH

		Description
Model	SV3NTMC010	Maintenance Service for Exaquantum/SSH
Suffix Codes	-S	Annual Contract
	1	Always 1
	1	Always 1
	-SV□□	Enter the number of Exaquantum/SSH Server Licenses
	-YYYY	Select an Option Code
	-N	New
	-R	Renewal
Option Codes	/WC□□	Enter the number of per-seat Exaquantum/SSH Web Client Licenses (1 - 99)
	/FMC□	Enter the number of FMC Historian Interface Licenses (1 - 9)
	/FDC□	Enter the number of FMC722 Data Collector Interface Licenses to one or more FMC TPUs (Topside Processing Units) (1 - 9)
	/FDR□	Enter the number of FMC722 Redundant Data Collector Interface Licenses to one or more redundant FMC TPUs (Topside Processing Unit) (1 - 9)
	/CAM□	Enter the number of Exaquantum/SSH Server Licenses to Interface to Cameron valve signature data files (1 - 9)
	/GEL□	Enter the number of Exaquantum/SSH Server Licenses to Interface to GE valve signature data files (1 - 9)

ORDERING INFORMATION

Specify the model and suffix codes.

TRADEMARKS

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