measX
Measurement System Experts

Case Study . Engine Acceptance Testing . Test Data Management

„measX brings together deep engineering insight with exceptional software expertise. Their rapid response time has been crucial when every second matters.“

Testbed Control Design and Administration
Projects Performance & Emissions

Project Profile	
Customer:	Everllence (formerly: MAN Energy Solutions)
Industry:	Four-stroke engines for marine and stationary applications
Project:	Test data management for engine testing
Task:	Enhance test efficiency and data quality, implement centralized data storage, and standardize reporting
Solution:	Server-based system with centralized, version-controlled data storage, automated report generation, and browser-based access
Software:	measX TDM Server, X-Frame analysis software, customer-specific software modules
Hardware:	Virtual Windows server
Key figures:	Over 200 users, measurements with up to 10,000 channels; approxi-mately 100 GB per engine and test

XXL Engines Under Spotlight

Everllence (formerly: MAN Energy Solutions) – Test Data Management for Factory Acceptance

Secure and Transparent Customer Acceptance Processes

The Initial Situation

Everllence, headquartered in Augsburg, is a global leader in large diesel and gas engines. The company specializes in room-sized four-stroke engines delivering up to 26 megawatts for marine propulsion and stationary power generation. Production takes place at the main plant and several international sites. Each engine is started and run-in for the first time at the manufacturing location, then subjected to comprehensive testing equipped with advanced measurement technology.

Before delivery, every engine undergoes a Factory Acceptance Test (FAT) to demonstrate compliance with customer requirements. This acceptance test involves extensive measurements of performance, fuel consumption, emissions, and other parameters. Results are documented in reports that require sign-off by both parties.

The Task

Everllence aimed to modernize its test system for four-stroke engines to increase test efficiency. The goals were to improve data quality, centralize data storage, and standardize reporting processes. The company required a robust, high-performance solution capable of handling large data volumes, offering easy scalability and maintainability. Existing report structures and validated calculation formulas needed to be preserved.

measX, a specialist in test data management with extensive experience in engine test evaluation, was commissioned to implement the project.

The Solution

The jointly developed test data management system supports the entire workflow – from acquisition of test data at the testbed to final report generation. The server-based solution, known as the TDM Server, features sophisticated data management, centralized data storage, server-based report generation, and a web application as the user interface. Custom software modules tailored for Everllence, along with measX's X-Frame analysis software, form the core of the system.

Centralized Data Pool

At the heart of the system is a central file server where all measurement data, calculations, and reports are permanently stored. An integrated database enables rapid access and complex queries using descriptive metadata standardized under a unified nomenclature.

Data flow is fully automated: after each test, the testbeds transmit measurement data to the TDM Server, where it is permanently and immutably archived. The importer module performs a wide range of pre-calculations, enriching the measurement data with derived values such as engine performance, fuel consumption, specific emissions, and heat output. Manual additions – such as comments, tags, or post-test values like laboratory fuel analysis – are also supported. All entries are version-controlled, ensuring the complete lifecycle of each measurement is traceable in detail.

The engines have more than 10,000 hp and are impressive due to their gigantic dimensions.

Data integrity is ensured: users cannot access the database or directories directly, but only via the TDM Dashboard. Data can only be added – deletion or uncontrolled modification is not possible.

Automated Reporting

Data evaluation is performed centrally on the TDM Server using X-Frame. Predefined evaluations and report templates exist for each test type. For acceptance testing, reports display approximately 200 values in tabular form; other analyses present results as charts and graphs. As soon as new measurement data is available, the system automatically generates the corresponding standard evaluation and stores the report as a PDF on the file server. Each report is digitally signed and includes information on its data basis.

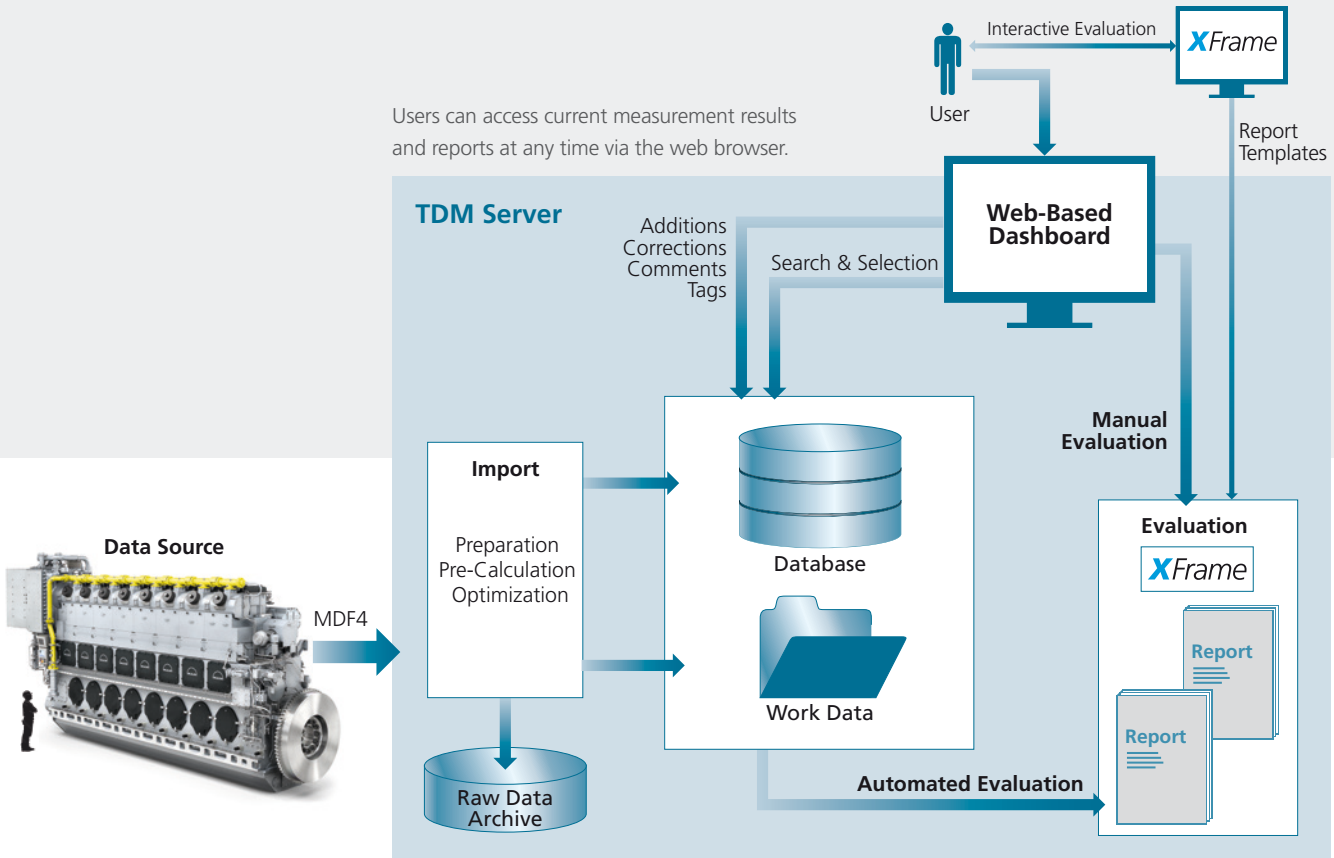
Fast, Browser-Based Access

The user interface is the TDM Dashboard, where registered users are automatically logged in. The dashboard displays the data inventory, enables navigation and search (with quick and detailed filters), and presents results in a clear list. Users can examine individual channel curves in detail and view or download existing reports.

Authorized users can transparently add justified correction values, comments, and tags to measurements at any time and initiate further analyses. Comparative evaluation of multiple measurements is also supported. As a web-based solution, the TDM system requires no installation, is accessible from any location, and always operates with the latest software version.

Defining Standards Internally

Everllence can define and modify calculation templates for X-Frame evaluations independently, without programming skills. X-Frame offers a graphical, interactive interface for creating and editing reports, a comprehensive formula library, and a formula editor with debugging capabilities for custom calculations. X-Frame is also the tool of choice for in-depth, interactive data analysis and comparative evaluations.



In Practical Use

At the end of 2020, Everllence commissioned the new TDM system in Augsburg and subsequently rolled it out internationally. Today, all four-stroke engine testbeds company-wide operate with the unified measX solution – serving over 200 users in Augsburg and manufacturing sites in India, France, and Denmark. Each location has its own server, with cross-site access enabled via the TDM Dashboard. All calculation functions and report templates are centrally managed and version-controlled in Augsburg. Users can quickly find the data they need, confident that it is up to date. Automated, standardized report generation enhances both security and comparability.

The system is easy to maintain and ready for future challenges. Everllence can parameterize and define new report templates as standards at any time. The system is continuously developed in partnership with measX.

The FAT, as the final test before engine delivery, is of critical importance. The new test data management system has achieved the set objectives: maximum transparency, clear traceability, high performance with large data volumes, and easy scalability. With its high security level, Everllence can always demonstrate to customers that engines have been tested in compliance with standards and that data quality is assured.

Key Advantages at a Glance:

- ***x*** Centralized data storage
- ***x*** High data quality (tamper-proof)
- ***x*** Standardization and comparability
- ***x*** Automated evaluation
- ***x*** Web-based application

From the control center, the test engineer has an overview of all important parameters and can view initial results.

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