QSI
teamqsi.com

Testability
Engineering
And
Maintenance
System

Semiconductor Manufacturing

An Advanced Field Service Intelligence Solution for Semiconductor Manufacturing Equipment

The drive for quality and productivity in semiconductor manufacturing is increasing the attention paid to the service component of manufacturing equipment and systems. Qualtech Systems Inc. (QSI) offers an advanced field service intelligence solution with significant benefits for equipment suppliers and their customers.

QSI's TEAMS solution is based on a simple "failure space" model of the equipment. Based on engineering data, field maintenance data, and expert knowledge, the model provides a graphical representation of the system's failure modes and all the diagnostic and prognostic tests the system employs. QSI has a wealth of experience building advanced health management solutions for high technology complex equipment manufacturers, such Orbotech, Ltd., FEI Company, and others.

For service organizations, QSI's solutions can

- **Reduce mean time to repair (MTTR)**
- **Increase first time fix rates**
- **Increase overall equipment effectiveness**
- **Reduce service parts consumed per visit**
- **Generate an average of 75% of the troubleshooting knowledge upfront, even in scenarios where there is no service history**
- **Increase the utilization of skilled Field Service Engineers (FSEs)**

QSI's TEAMATE application translates results from diagnostics, automatic tests, and tests conducted by the technician into clear instructions on the action to be taken next.

Using this software, even inexperienced technicians can quicly learn to perform at expert level.

The methodology

QSI uses relationships and techniques that are compatible with FMEA (Failure Modes and Effects Analysis) processes, testability engineering, R&M (Reliability, Maintainability) engineering, and Safety engineering.

While other approaches require intimate knowledge of system behavior, thorny algorithms to describe behavior, complex state diagrams, or networks of complicated relationships and numeric weights, QSI's qualitative system modeling approach allows the engineer to build hierarchical block diagrams, capture failure modes, capture functional failure manifestations, and capture testing information. From these inputs, the modeling tool can compute testability and diagnostic performance characteristics.

Applications based on the TEAMS model can be deployed quickly, in time frames measured in man-weeks or months, using practical knowledge that is available in your organization.

Putting knowledge to work in the field

The TEAMS model makes field service engineers (FSEs) more productive. It performs an initial diagnosis from all observations (BIT, Fault Codes, and manual inspection), and then dynamically sequences the “next best test” to intelligently and interactively drive Interactive Electronic Technical Manuals (IETMs). Recommended procedures are generated step-by-step and “on-the-fly” based on:

- current symptoms
- relationships between failure modes, symptoms, and tests
- failure rate data
- time and cost of testing and repair
- resources on hand

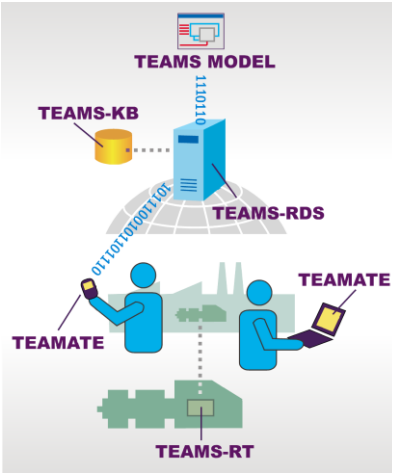
QSI’s browser-based software runs on any PC-compatible computer device.

Knowledge refinement using field data

Data on the causes and consequences of system failures feeds continuously into the TEAMS-RDS knowledge base. This data can be used to refine the system models, improve the management of spare parts, refine training programs, guide future design modifications, and measure the quality of service, components and suppliers.

On-tool diagnostics

TEAMS-RT, an ultra-fast, ultra-compact embedded “reasoner” uses system information from the TEAMS model to perform diagnostics in real time and generate system health assessment continuously.



TEAMS-RDS used for remote troubleshooting and TEAMATE on a standalone portable computer used for onsite maintenance. Information on the standalone computer can be periodically synchronized with the server.

Remote diagnostic session support

TEAMS-RDS is a network solution that can be easily deployed for use across your entire field service organization. With the system model deployed on one or more servers, tests can be conducted interactively, and clear accurate instructions dispatched to technicians around the world. This application has been shown to reduce travel costs and improve the speed and quality of field service, by reducing the number of false removals. Since only the fault code information and recommended actions are transmitted out of the fab when permitted and not raw data, no customer or supplier intellectual property is compromised.

About QSI

Founded in 1993, Qualtech Systems Inc. (QSI) is a recognized leader in advanced field service intelligence solutions. QSI has received awards from NASA (2002 & 2008 Space Act Award) and Aviation Week & Space Technology ("Technology Innovations 2002").

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