



# OPTIMIZED CAUSE/RESPONSE SYSTEM INCREASES PRODUCTIVITY AT TRW



TRW is one of the largest global suppliers of components to the automotive industry, offering its high-tech products and services to a wide range of clients in almost every country in the world. TRW Automotive employs 64,000 people in 185 facilities spread across 23 countries.

TRW Automotive is organized into six divisions:

- Body Control Systems
- Braking & Suspension
- Engine Components
- Engineered Fasteners & Components
- Occupant Safety Systems
- Steering Systems

Its Alfdorf site produces occupant restraint systems (airbag modules and seat belts) for almost every automaker and leading supplier. In addition to manufacturing components and airbags, the Alfdorf site now has an innovation and technology center with three crash test facilities. The newest of these was opened in May 2003. This ensures that all newly developed products are checked in minute detail before they go into production. The special features of this site are:

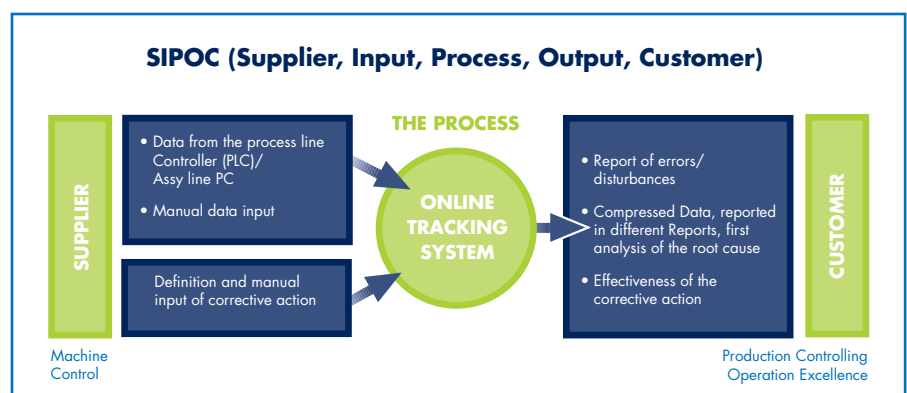
- The most up-to-date skid technology
- Innovative light engineering
- High-speed digital cameras
- Brand new generation of dummies

- Special client areas
- Separate analysis labs
- All types of side impact crashes simulated

## Starting point - excessive manual labor

The initial situation was that faults occurring during airbag production were entered manually, via tally sheets, at every machine and at final inspection, into inspection charts. These were not only incomplete (since numerous faults were not being entered), but yielded little value because they were difficult to analyze and there was little chance of reducing the data. The result was that major faults were only being identified slowly and with difficulty.

SIPOC (a Six Sigma tool) is used to study the entire chain, from supplier to client, so that the problem can be resolved.



# Adicom® INCREASES PRODUCTION AND CONTROL-TRANSPARENCY TO GIVE TRW SIGNIFICANT COMPETITIVE ADVANTAGES

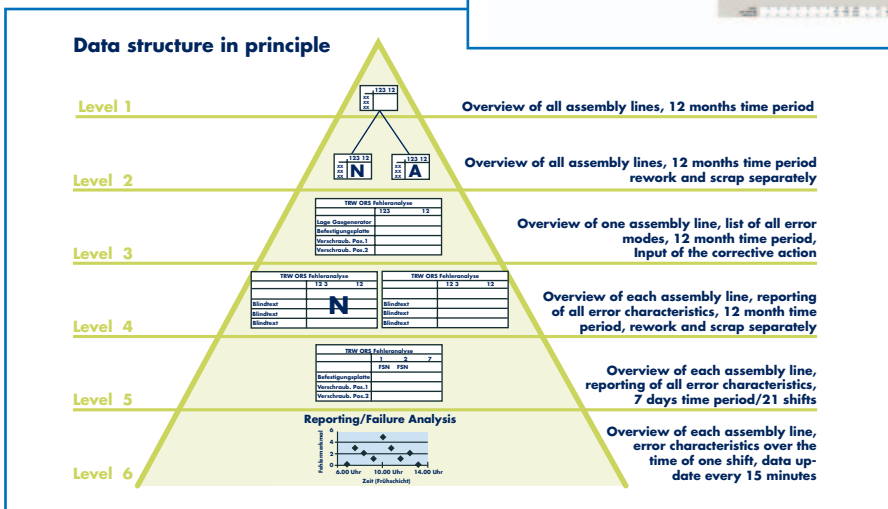
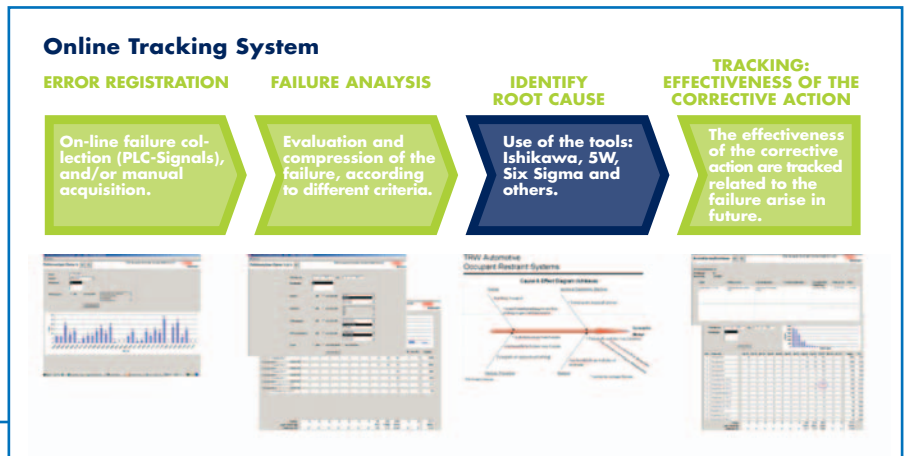
## The objective - more transparency in Production and Control

Driven by the aim of reducing the number of faults and malfunctions in airbag production, the development of a cause/

response system was initiated which would succeed in making airbag production control and management more transparent in Alfdorf. The fault data is automatically transferred from machine control systems or line PCs. Manual input is now only

required for faults that cannot be logged using the control system technology - e.g. visual defects. Identifying and inputting fault causes and the corrective actions to be carried out is done by production control and the technicians. As a result, fault and

The Online Tracking System supports three main areas: Fault logging, fault diagnosis, and remedial measure effectiveness testing



There are several levels to the data structure, and each level can display various degrees of data reduction. Data reduction goes from Level 1 (highest degree of reduction, a 12-month window, all assembly facilities included in the overview) to Level 6 (lowest degree of reduction, an 8-hour window, one assembly line).



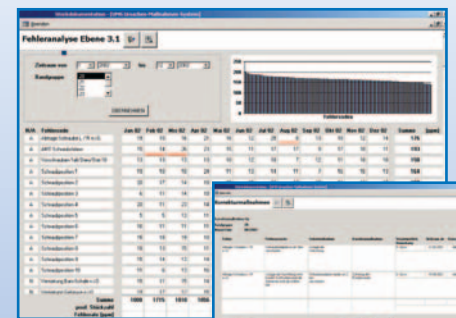
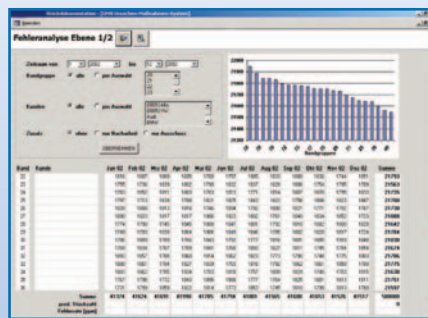
malfunction data can be displayed in different ways and at different levels of detail, while the effectiveness of corrective measures can be tracked.

Data reduction means that supplier problems can be identified more easily and that suppliers can be brought into the process quickly and to greater effect.

User-friendliness in the normal MS Office interface, with no need for time-consuming manual system maintenance, was a further requirement. Reduced data is provided as key figures and all analyses are automatically generated as uniform quality charts. Great value was placed on being able to track the fault from the point at which it is recognized, through the identification of the cause and the corrective actions performed, to the effectiveness of the remedy.

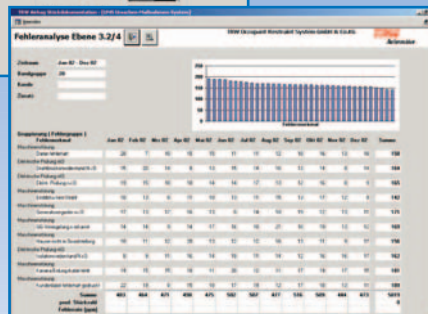
## Implementation

The "OTS Online Tracking System" was implemented by Adicom® Informatik GmbH in Balingen between August and October 2003. Adicom® went for the flexibility and experience gained from developing MRM® Multi Resource Management. The airbag production lines are connected to the OTS system online via SIEMENS S7 control systems.



Overview of all faults, all production (all assembly lines) over a period of 12 months. Initial fault analysis is achieved by varying the data selection. Key figures are calculated based on finished quantity and fault rates that have occurred.

Overview of all faults per assembly line over 12 months. In the overview, the fault rate per fault characteristic is underlined in red to show remedial measures (effectiveness testing). Double-click on the red underlined text to bring up a separate view showing all remedial actions.



Same display area as level 3.1. Level 3.2 offers the option of varying data selection by: client, workstation, fault group, code number and waste/rework.



Level 6 displays the fault rate per shift in a 15-minute-cycle. It may be possible to identify faults relating to time here (e.g. at the beginning of shifts, after breaks, etc.).

**Benefits and Advantages**

- Significantly improved production line performance and a substantial increase in productivity (over 5%) can be achieved.
- The availability of online data and the online identification of major faults means that cause analysis and the introduction of remedial measures can begin right away - long before the products concerned are installed. Faults that appear in the morning shift have been remedied by the next shift.
- Data entered once can be re-used many times - for technical analyses, quick decision-making about the current production process, long-term assessments of remedial measures, and production quality monitoring.
- Significant competitive advantage production quality can be convincingly demonstrated to the client.
- Support for the claim made by the client (Ford): "effective daily management reviews."

**Adicom® – we manage your resources**



With the Adicom® Software Suite, we can integrate the management of all resources, such as labor, machinery, production resources, and information. It is an excellent tool for helping companies achieve their objectives and design their business processes on the shop floor and in logistics and services. Adicom® consists of complementary sub-systems (e.g. Adicom® Advanced Planning and Scheduling, Adicom® Shop Floor Data Collection/Machine Data Collection, Adicom® JIT/JIS, Adicom® Traceability, Adicom® Time and Attendance, etc.) and thus provides ongoing support

through integration, flexibility, and automation. Major organizations such as Deutsche Post AG, Dynamit Nobel, Rhenus, Unilever, ThyssenKrupp, Brillux, Benteler, ABB, and many others are already putting their faith in Adicom®'s groundbreaking IT solutions.

Adicom® Informatik is a subsidiary of Freudenberg IT KG, located in Weinheim, Germany, which is part of the global Freudenberg group that has more than 30,000 employees.

We would be glad to demonstrate our expertise to you. Please contact us - we're looking forward to hearing from you.

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