

# Test Results Database

**Special points of Interest:**

- Large quantities of data obtained over the years and recorded using different media was difficult to search.
- A test results database system was developed to archive large amounts of data and provide search functionality.
- Trends in performance were easily identified.

## The Problem

Our client's research department is responsible for product development and testing. This involves instrumenting the product, applying the environmental loads and recording the results for later interpretation. A variety of sensors is used, and data are sampled at regular time intervals.

Over a period of 15 years, a large quantity of information had been recorded and archived on several different media. The testing procedures and data formats had changed periodically. It became apparent that much

of the value in these records was wasted because searching for characteristics in archived data to compare with more recent tests became a difficult and time consuming task. It was often found that data had been lost through poor record keeping or deterioration of magnetic media. It was clear that the way forward was to use a database system, but the client was not able to invest in developing an application using in-house IT skills. To solve this problem, Eatec was able to offer its Test Results Database (TRD).



## The Approach

The purpose of Eatec's Test Results Database is to:

- Archive securely large quantities of test data
- Offer a search engine for retrieving data with similar characteristics
- Provide a data viewer
- Export data to other applications

The screenshot displays the TRD software interface. At the top, a 'Search RDB Database' window shows search criteria for 'Trial ID', 'Test Engineer', 'Test Date', 'Avr Torque (ft-lbs)', and 'Avr Temperature (degrees C)'. Below this is an 'Explore TRD Database' window showing a tree view of test data organized by user: Andrew Davis (000001), James Wilson (000004), and Matthew Smith (000003, 000002, 000005). To the right, a calendar for January 2003 is visible, with the date 14th highlighted. At the bottom, a 'Search Results' window displays a table of test results.

Trial ID	Test Engineer	Test Date	Continuous Summary Avr Torque (ft-lbs)	Continuous Summary Avr Temperature (degrees C)
000001	Andrew Davis	12-Jun-1998	686.5886	35.18687
000002	Matthew Smith	11-Jun-1998	1871.176	40.33805
000003	Matthew Smith	12-Jun-1998	791.339	37.92725
000004	James Wilson	15-Jun-1998	692.5373	30.87022

## The Results

For our client, the first step was to identify the data and associated formats to be transferred to the database. Summary parameters were defined that could be used to characterize the data such as maximum, minimum, mean values and some forms of proprietary processing. These parameters could be queried by the TRD search engine. From this information, Eatec developed a custom data reader to transfer all existing data and the new summary parameters into the database. This data reader is the primary method for adding new test results into the database and has been periodically modified when data formats have



Most of the data held in the database came directly from the sensors, including forces, pressures and accelerations. Other stored data are derived from processing carried out by the data reader on the raw sensor channels. The derived data can also be queried by the TRD search engine.

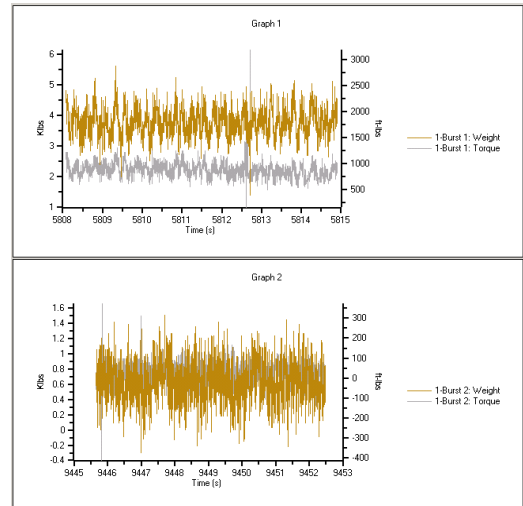
Being able to query the database has brought to light changes in product performance over time that had previously gone unnoticed. The ease of presenting archive data in a relevant graphical format has made the use of this application popular with the client and has avoided the need to employ specialist IT staff.

## Benefits to the Client

Of particular benefit in this case is the feature of the TRD to export data directly into other applications where Microsoft's Excel and Word are used for reports and presentations and The Mathworks MATLAB® for data analysis.

The installation of Eatec's TRD has:

- Provided a secure archive facility for historical, current and future test data
- Identified trends in performance with changes in product design
- Facilitated data processing previously difficult to achieve
- Saved time and costs compared with previous methods of working



**Any combination of data series can be plotted on any graph**

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