Chapter 6

IT Applications to Support Restructuring

6 IT Applications to Support Restructuring

It would be virtually impossible if IT is overlooked in providing advantages and leveraging resources capability in order to make smooth transition in the restructuring. IT is a powerful and cost-effective tool when it is utilized appropriately. Test engineering is well aware of its necessity when dealing with massive data collection, routine data processing, engineering data analysis, real-time problem solving demands, and information for management decision making. Figure 6.1 exhibits Test Engineering's IT strategy of year 2000, an infrastructure incorporated with future development.

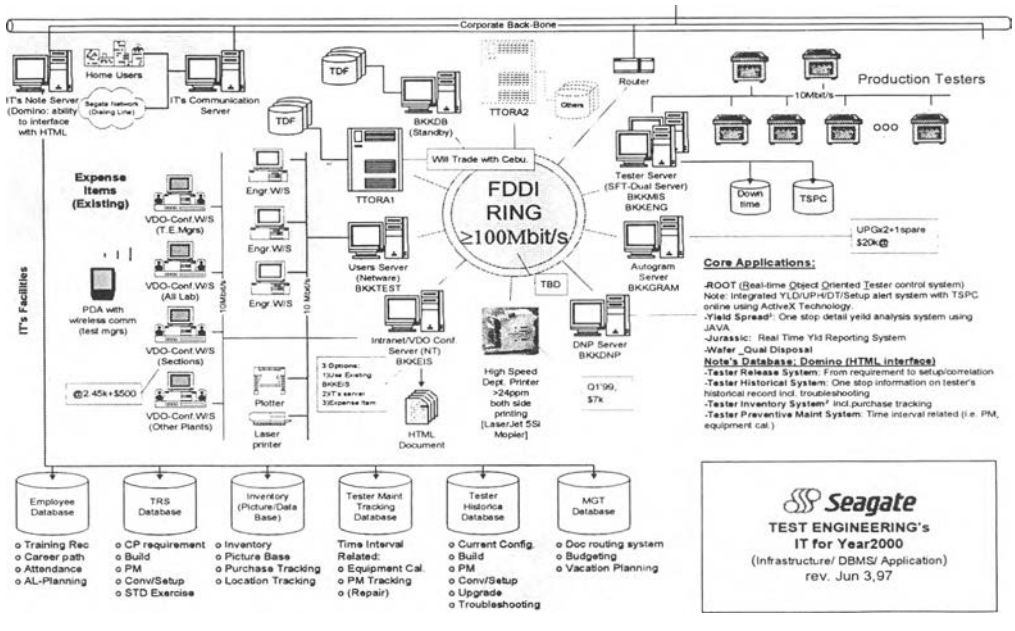

Figure 6.1 Test Engineering's IT strategy

The structure is laid out to support 3 tiers client/server architecture. Application developers are encouraged to develop application on Intranet platform for easy access throughout the company. Data warehousing approach is the solution for multiple view applications that require same source of information. It will allow cost effective database maintenance and administration. Personal data assistance (Palm PDA) is planned to be a handy assistance for key persons in the organization. Its information will be synchronized to common database via Intranet.

6.1 Intranet

EISWEB, an intranet web site has been established to be an interface for employee accessing to related information and applications, which are developed to be engineering and management tools, the picture of the EISWEB is shown in figure 6.2.

The home page also has links to other interesting sites within Seagate as well as a link to Computer Based Training (CBT) of test engineering, as shown in figure 6.4, which contains from basic knowledge of tester, tester simulation, up to tester assembly and calibration procedure. It is very useful for newly hired employee both technician and engineer, they can learn and refer to electronics document which is kept updating regularly. This CBT, in several pages, has animation of some procedures for ease of understanding the complicated procedure if it is explained by text. For example on a test simulation, where a hundred of pages with text explanation can we replaced with one nice picture of test related diagram with 20 different frames explaining each step of the test through data processing system.

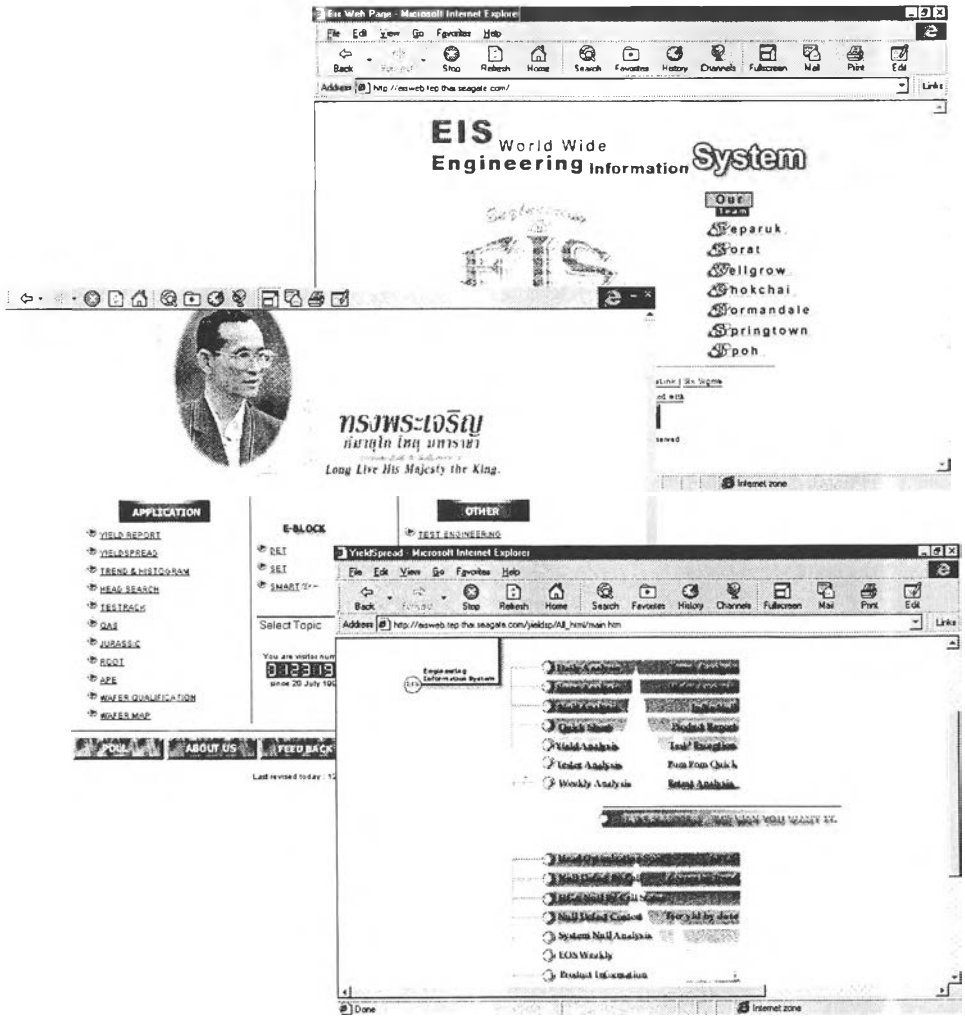

Figure 6.2 EIS home page including analytical tools for Engineering, an IT leverage to support restructuring (http://eisweb.tep.thai.seagate.com)

6.2 Systematic Analysis Tool

It is very important for engineering work to have a systematic analysis tool to assist their execution in day-to-day activities, such as yield monitoring and yield analysis.

Since yield analysis is included in test engineering responsibility and became a stopper for Product Test engineer to spend their time for tester control and for developing technical resource capability, as well as improving new engineer's learning curve.

This becomes one of the major activities in restructuring, and have to keep a minimal level of impacts due to the transition. One great way is to have

an effective tool performing all the systematic works for human, then human can do more advanced jobs.

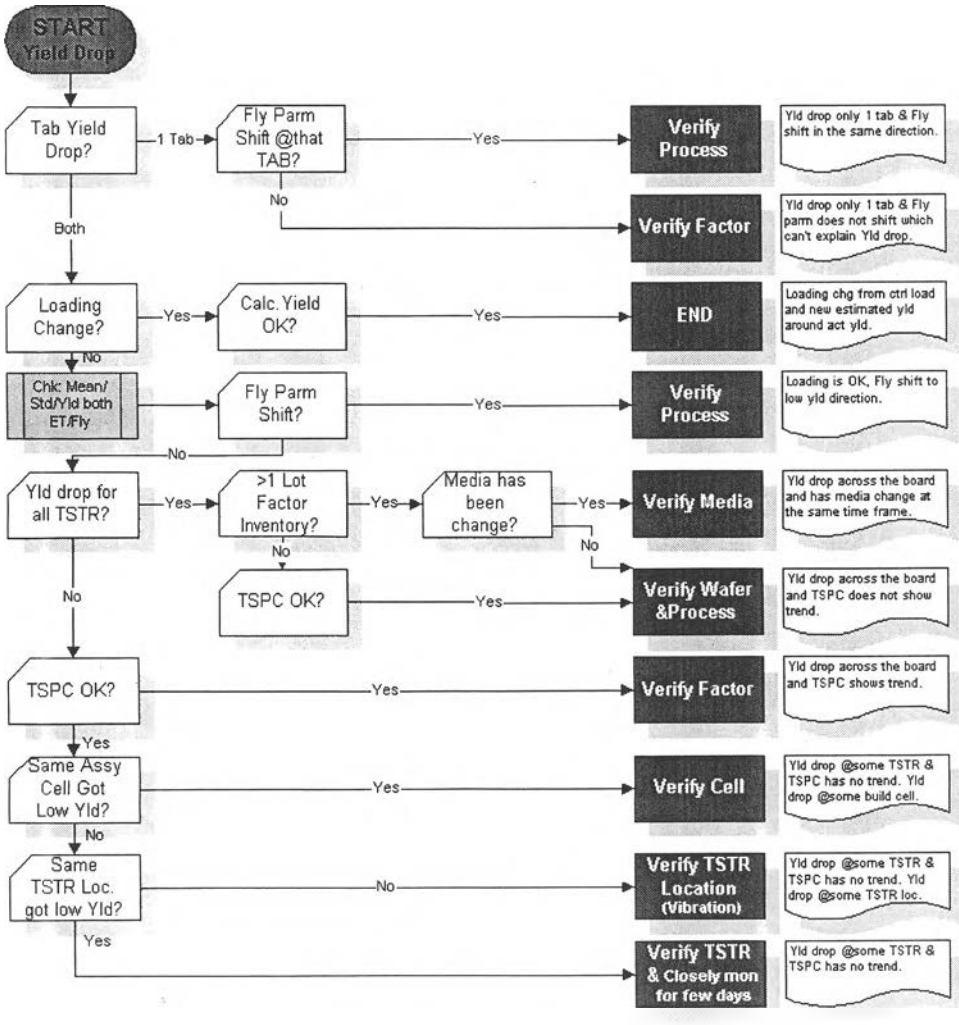

Figure 6.3(a) Yield Analysis Flow, a standardized analytical process for engineers. (http://cbt.tep.thai.seagae.com/org/flow/yld.htm)

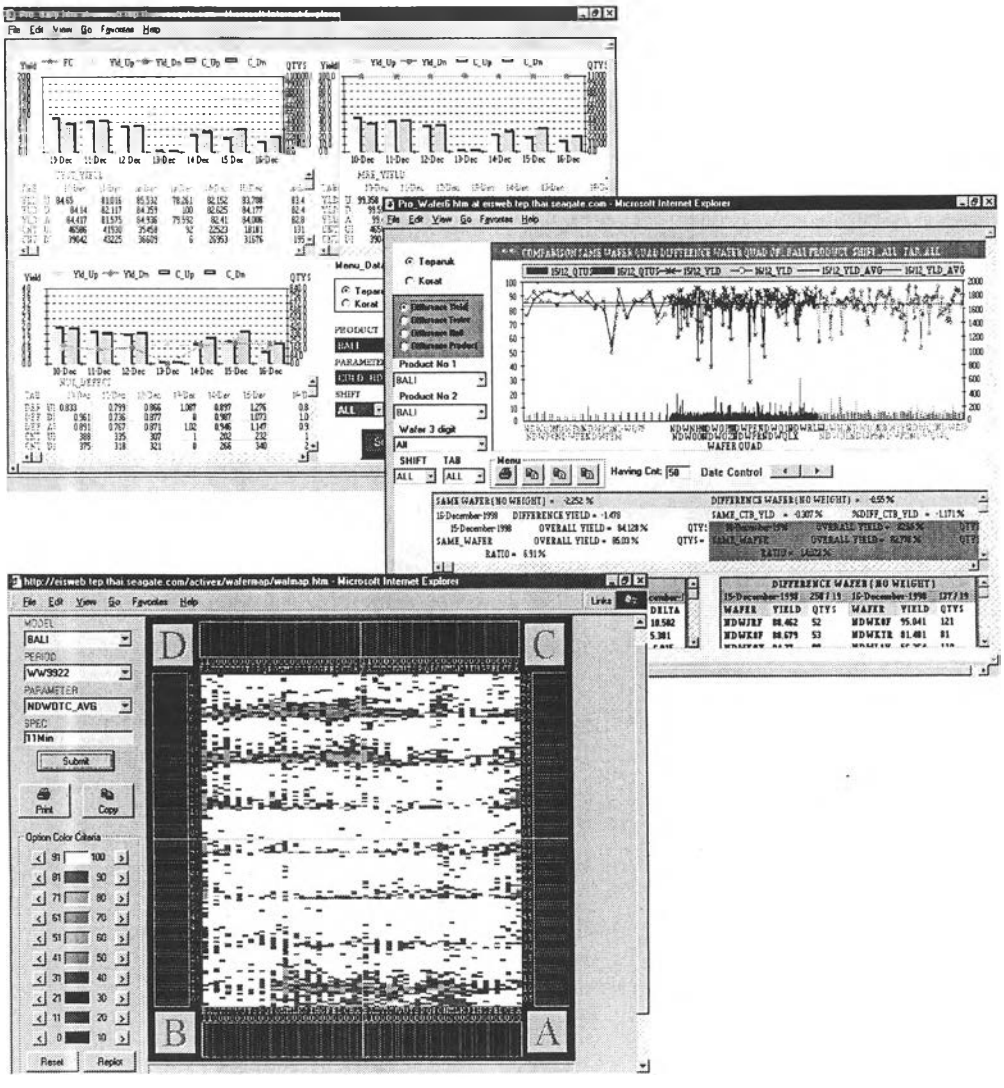

Figure 6.3 (b) Yield Analytical tools for day-to-day activities. The upper is a yield trend, the middle is internal and external yield contribution, and the lower is wafer mapping for advanced analysis. (http://eisweb.tep.thai.seagate.com/yieldsp/)

Instead of 4-6 hours data manipulation to get a comprehensive format for advanced engineering analysis, the process has been automated as a routine at night and made ready on EISWb every morning. It improves speed and efficiency in manufacturing feedback system at least half a day. The beauty of the system is that everyone summarizes and presents data in the same format.

6.3 Knowledge-Base and Computer-Based Training (CBT)

Dealing with technical organization that has limited resource and keep catching up the new technology, how organization can leave newly hired resource and/or less experienced resource behind. A self-development tool is required, CBT is selected to be that tool for many reasons. One major reason is its accessibility, where everyone can access onto it anywhere in Seagate's world.

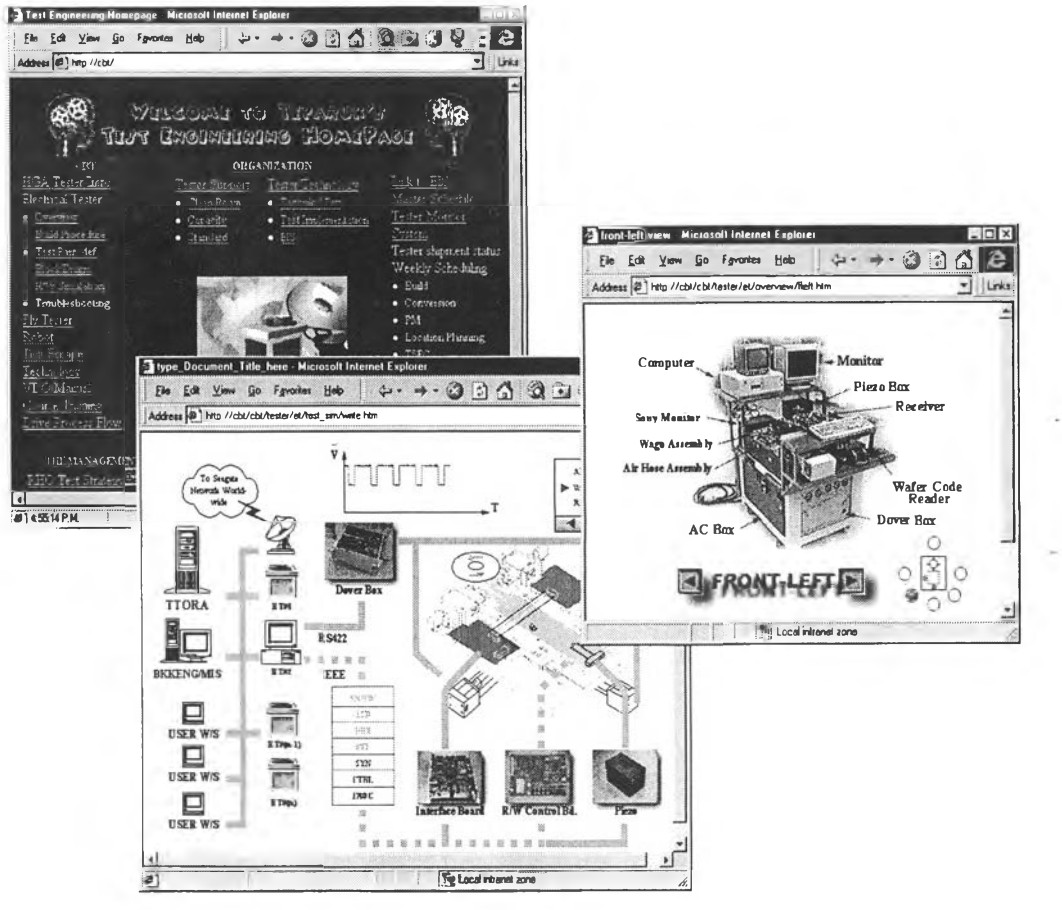

Figure 6.4 Computer-based Training (CBT) for self-learning and reference, a knowledge base is being developed in there.(http://cbt.tep.thai.seagate.com/)

Figure 6.4 demonstrates the CBT home page and couple examples of tester related training page. The right most picture is tester overview where engineer can rotate to any elevation and has detail picture with terminology of major piece parts via Hyperlink. The lower picture is test related diagram with animation to explain each step of test from tester initialization, positioning, performing test, up to data collection, processing, and reporting.

Instead of obtaining a ream of copy for each engineer and technician, the updated information can be accessed from anyone's desktop anywhere in Seagate.

6.4 Real-time Monitoring Tool

Real-time Object Oriented tester monitoring Tool, ROOT is a very successful project that provides test engineering and frontline people to monitor their tester performance in virtual real-time basis.

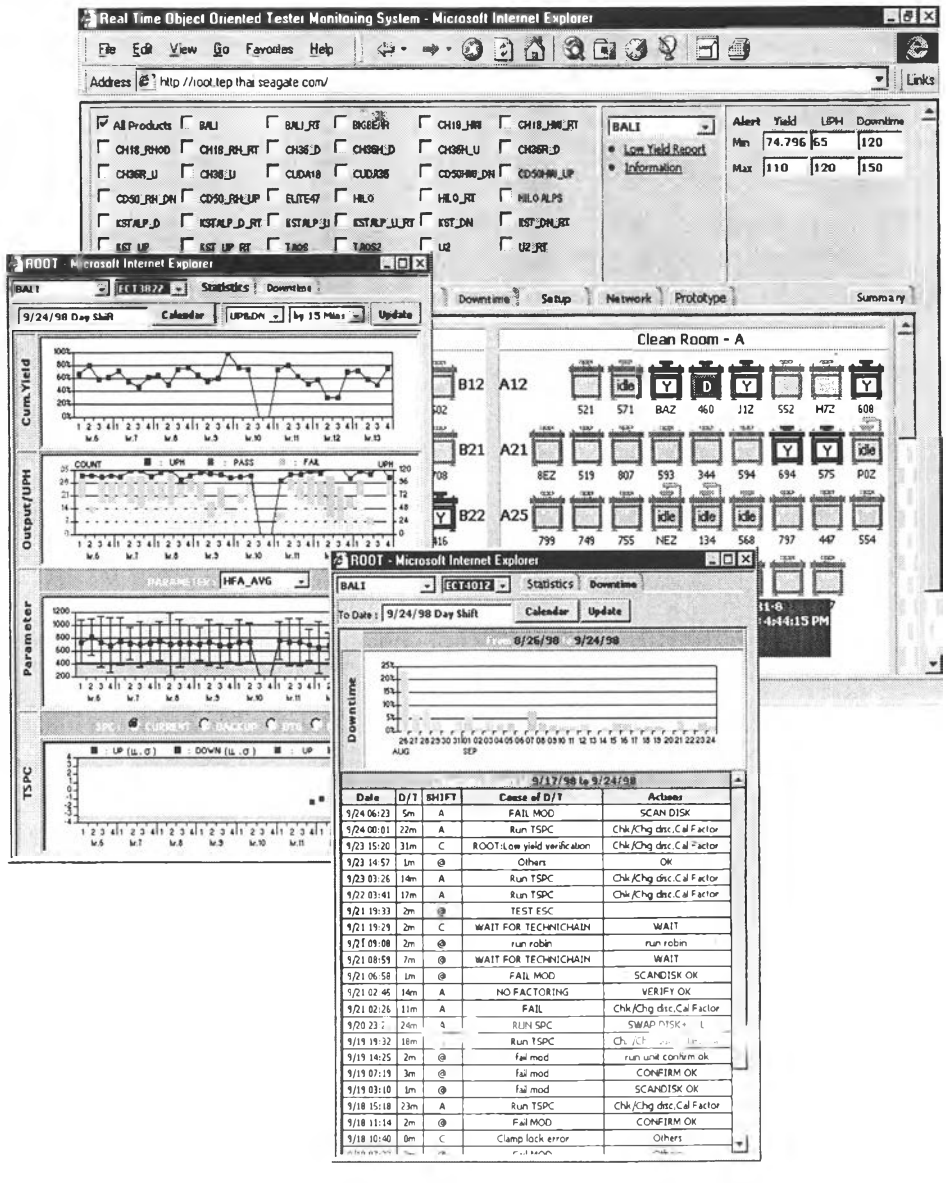

Figure 6.5 Real-time Object Oriented Tester monitoring system (ROOT), a powerful tool to improve speed of reaction. Proactive actions are being developed from its knowledge base (http://root.tep.thai.seagate.com)

It is on intranet platform where everyone can access from anywhere in Seagate as shown in figure 6.5. From top to bottom, the first picture is the page that shows tester at location as an object with highlighted code providing status of the testers in the shop floor where user can choose specific product(s). The second picture is the page that pop-up when the object is clicked, it provides statistical trends of yield, parts tested, UPH, selected parametric performance, and tester SPC (TSPC). The second picture is another page that pop-up when "Down time" is selected, it provides information of tester interruption exercises over time where technician or engineer can trace what is happened on the tester and what action is taken by whom. This acts as an electronic logbook that keeps generating an electronics database which can be used for knowledge base development in the future.

It improved tester reaction lead-time from 7-14 hours to within 1-2 hours. The required information is updated and available for frontline people every 15-30 minutes instead of 420 minutes as before.

6.5 Management Information

There are several aspects in several dimensions of test related measures for day-to-day operation. Managing a multiple function organization supporting 24 hours manufacturing requires consolidated information to check and balance activities within the organization which links to yield and output of the operation.

Test engineering's exception report is a solution, managers can have all primary information, which links to yield and output of the operation, all together in one page with a specific view. It is shown in figure 6.6 above, highlighted figures in the table indicated abnormal status when compare to specified threshold and user can click-on for a link to historical information.

Prior to having the exception report, it was virtually impossible for manager to review overall picture in timely basis. To get a summary of 15 aspects of more than 20 products in different dimensions, it requires more than 50 man-hours a day to consolidate information from more than 300 menu for such analysis.

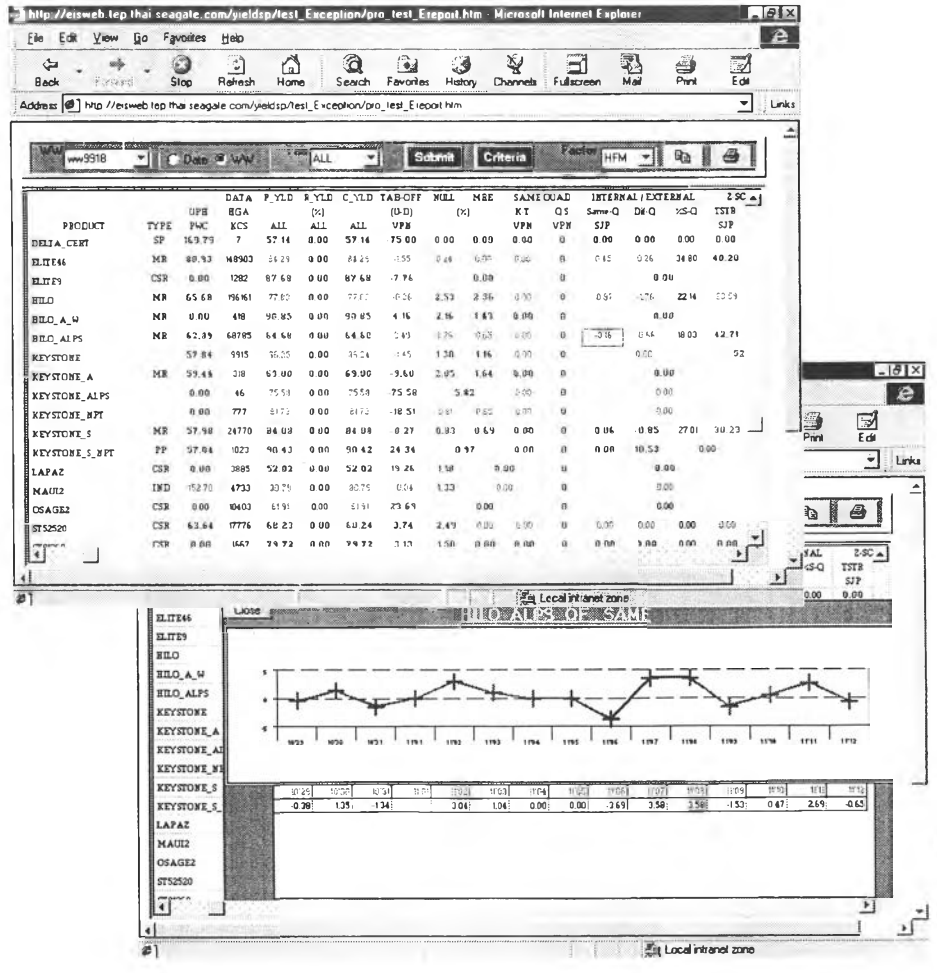

Figure 6.6 Test Engineering's Exception Report (http://eisweb.tep.thai.seagate.com/yieldsp/test_Exception/pro_test_Exception.htm)

Exception report allows manager to take only 15-30 minutes every morning to analyze, highlight, and prioritize special tasks to subordinate as required. The report includes external benchmarking with other sites and internal benchmarking based on historical information, name of responsible persons are assigned in each column as an owner.

There are several information being worked out to bring them onto EISWEB, such as objective goals measures and performance measure of the organization. This can allow employee to see them in regular basis and know what action to be taken prior to management review.