

## CHAPTER 7

# CONCLUSION AND RECOMMENDATION



### 7.1 Conclusion

SECS is a standard that intends to change the working environment of semiconductor equipment from stand-alone machine to network system. Although it was introduced for long time ago but it is not widely used because advanced technology is required. Moreover, it has some weak points on the initial revision. However, since the Integrated Circuits manufacturing process tends to be automatic factory, many semiconductor equipment manufacturers have developed and installed this standard into their machine now.

The die attach machine error detection is developed by using the SECS standard with intends to detect the machine processing state and machine errors. The system interacts with the equipment without the assistance from the external operator. Whenever the machine processing state transition occurs, the die attach machine error detection system can detect and then record into an electronic file. Likewise, every machine errors are also detected by this system so that the information from the error detection system is much more accurate than the existing system (down time record system). Since every machine activities and errors have been recorded in an electronic text file, it is useful for further analysis such as machine utilisation, capacity planning, quality improvement, machine utilisation improvement, etc.

The machine utilisation based on information of the die attach machine error detection system is more accurate than the down time record system. In the other words, the actual can be known by using the information from the error detection system for calculation.

In order to improve the machine utilisation, the correct information is required. The improvement plans will not be effective if it is based on the in-accurate information. Hence, the die attach machine error detection system that records every machine activities onto an electronic file is a better system than the down time card recording system for the machine utilisation improvement.

Since the capacity planning is based on the number of machine utilisation, the company can improve the accuracy of this process through the error detection system.

Therefore, the die attach machine error detection system is a system that provides more accurate information than the down time card record system. The data of analysis that is based on information from the error detection system is more reliable than the down time card record system. In addition, information on the system is useful for both machine utilisation and product quality improvement.

## 7.2 Recommendation

This system refers to SECS standard for host communications so that it required the corporate of suppliers to develop their machine with compliance to the SECS standard. This system can not be implemented on any machines that do not have a feature of SECS communication.

Although the die attach machine error detection system is much useful for capacity planning, machine utilisation, and quality improvement, this system can not detect the other errors or problem that do not relate to equipment such as processing errors or material problems. It still requires external detection when these errors occur during the machine operation.

In order to improve the system, it should be developed to be the "Electronic down time record". The equipment errors shall be detected by the error detection system automatically while the processing errors and material problems shall be detected and recorded by the operator onto the electronic down time. Hence, all errors and problems shall be detected and recorded onto an electronic file. Therefore, the improvement plans shall be developed based on the completed information.

The other machine communication systems that can be developed by based on the concept of the die attach machine error detection system are as below:

**1) Periodically parameters recording system**

The system is defined to access to the selected parameters in the machine periodically, and then record onto an electronic file. This is to check the parameters whether it is in the control range or not. This system can reduce the paper work in the production line since the operators are assigned to monitor the machine parameters periodically.

**2) Parameters control system**

The machine parameters can be defined and controlled through a host computer. The operator or technician just defines the parameters, its expected value, and the required machine on the host computer, such parameters on the specific machine shall be changed immediately.

**3) Wafer mapping**

This is a capability of the ESEC die attach machine model 2007. The circuit chips (die) are picked up from the mounting tape by refer to an electronic map file.

**4) Factory automation**

All die attach machines shall be linked to the host computers as module. The operator can control and operate many die attach machines through a host computer such as start, stop, monitor machine parameters, monitor the number of attached die, etc. Therefore, an operator can control more number of the machine than the current process.