

**COMMONWEALTH EXECUTIVE
MBA/MPA PROGRAMME**

Term-End Examination

June, 2007

**SC-4 : QUALITY ASSURANCE
MANAGEMENT**

Time : 3 hours

Maximum Marks : 100

(Weightage 70%)

Note : *There are two sections. Section A comprises of five questions carrying 20 marks each. Attempt any **three** questions from Section A. Section B is **compulsory** and carries 40 marks.*

SECTION A

1. "Leadership plays a crucial role in developing, nurturing and supporting a quality organisation." Comment on the statement taking into consideration the quality values throughout the organisation. 20
2. Discuss the concept of managing supplier relationships and its role in quality management. 20

3. Critically comment on the root constraints with respect to quality in Human Resources. 20
4. Briefly discuss the tools used in quality planning. 20
5. Do you think that standards are important in the present context ? Explain. Discuss the strengths and limitations of standards. 20

SECTION B

6. Read the following case and answer the questions at the end of the case study.

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INTEGRATING DESIGN AND PRODUCTION AT SUNDSTRAND

“If it isn’t broken, fix it any way. Improve the process. We look at everything as a process,” said Richard Baker, manager of continuous improvement systems at Sundstrand Data Control Inc., manufacturers of instruments and avionics for the defence industry. Sundstrand had prime defence contractors such as General Dynamics, McDonnell Douglas and Honeywell Space Systems.

The company claims remarkable production, cost and quality improvement. Rework on some production lines is down by 66 per cent, scrap cost cut by 60 per cent, quality up by 50 per cent and cycle time down by 90 per cent. Despite these advances, Baker was of the view that fully integrating the Total Quality Philosophy with company culture could take another five years and that the ongoing effort will never be complete.

Production workers were especially proud of a magnet assembly, a delicate small device loaded with integrated circuits. It is used in inertial navigation systems. Sundstrand planned to knock out the Japanese out of this market.

Manufacture of the magnet assembly is a complicated process, progressing through six work stations (each in one room). The workers in each work station make up a work team. The process is called "*Kanban*" and relies on simple visual cues from the previous step in the process to inform the work team when parts are needed (using a pull system of production). With this information, the team can distribute the workload, since each team member is cross-trained to do all the tasks necessary to move the item to the next step in the process.

Another simplification is a "*traffic light*" like the one seen at a street intersection, which hangs in the hallway where everyone in the work team of a particular production line can see it. If the production process is flowing smoothly, the light turns green. If a problem occurs, the light turns yellow and then red. This is the one for workers to scramble and find a solution for the problem causing red light.

Sundstrand's TQM program also contains "*concurrent engineering*" which integrates the manufacturing engineers with design personnel. This approach is vital because 80 per cent of the cost of Sundstrand's products is in the design process. To make them cheaper, one has got to design a part better.

The "traffic light system" at Sundstrand is a method pioneered by Shigeo Shingo and frequently called "*Shingo Method*". This method is justified by giving two basic reasons for the use of traffic signals :

1. They are a great visual communicator to all employees, telling them the status of their production lines.
2. They lend an air of urgency, reminding all the employees of the key thing that counts : on-time shipments of quality products to their customers! By indicating the problem and who is directly responsible for solving it, there is little left to chance in order to drive to get the line going again.

A *green light* indicates a production line is running smoothly. There are no material, people, machine or process problem at this time. Finished products are being produced on schedule.

A *yellow light* indicates a problem exists or is about to surface that is either impending the scheduled flow of material or is about to. Yellow lights indicate things such as faulty machines requiring attention, missing personnel, parts requiring modification on the line or potential missing parts that may cause the line shutdown in the near future (two to three days).

A *red light* indicates a line is shutdown, that is, no finished products are able to flow off this line. Typical causes of red lights are missing material, broken down equipment, missing key personnel, irregular parts requiring excessive modifications to work properly and missing or dysfunctional tools.

In all cases at Sundstrand, it is the responsibility of the line manager and his or her personnel to operate the traffic light to indicate that a production problem exists. According to Shingo, "It is a poor supervisor who never shuts down his line, for he is not exposing quality and productivity problems. His product is not getting better. Likewise it is a poor supervisor who continuously shuts down his line for the same reason. For he is continuously exposing the same problem over and over with no permanent solution."

Questions :

- (a) What are the implications of the statement "If it isn't broken, fix it any way" ?
- (b) To what extent, can the remarkable improvement at Sundstrand be attributed to the *Shingo method* ?
- (c) How would you go about integrating design and production ?