

## **Improve Reliability! in Industries Improve Productivity!**

*The critical period in the life cycle of equipment or a system is its error free operating condition. Though no any equipment or a system is perfect, it is likely to fail, however, its life can be increased if regularly maintained and put into operation regularly. In most of the cases, preventive maintenance policy can eliminate failures to a large extent. The philosophy' prevention is better than cure" applies to equipments and systems also.*

*- Dr. A.G. Matani*

### **Reliability & quality:**

Reliability of a component is the probability to perform its intended functions regularly for a specified period of life under stated working conditions. Quality is associated with the design. A failure is the partial or total loss of those properties in such a way that its functioning is partially or completely stopped.

### **Causes of failures and Unreliability:**

Some of the specific causes of failures of equipments and systems as identified by Prof. E. Balaguruswamy and A. G. Robertson are as stated below:-

- Poor design of components and systems
- Wrong manufacturing techniques
- Lack of total knowledge equipments
- Complexity of equipments and systems
- Poor maintenance policies
- Organizational rigidity and complexity
- Human errors

### **Techniques For Improving Higher Reliability:-**

Various members of techniques as identified by D.K. Lloyd and M.Lipow are as discussed below:--

1. Parts improvement method
2. Effective and creative design
3. Systems simplification
4. Use of over-rated components
5. Structural redundancy
6. Maintenance & repairs

### **Parts improvement method**

In this method, most critical components are identified and their reliabilities are improved. This requires applications of improved production techniques and automation.

### **Effective and creative design**

This requires design of new or improved method or systems with better reliability.

### **Systems simplification**

The proper use of components and reducing complexities of poorly designed and overly complex systems can be through implementation of systems simplification methods

### **Use of over-rated components**

This method is utilized where failure rates of most components change with their operating stresses.

### **Structural redundancy**

This method provides a very effective means of improving systems reliability. This requires duplication of paths at the components level and seems to be the only solution when high reliability and over-rated components are not available.

## **Maintenance & repairs**

Regular maintenance & repairs increase the systems reliability. A well-maintained system when combined with redundancy has a high reliability.

### **Conclusions:**

Poor design and incorrect manufacturing techniques are the main reasons for low reliability. Improper selection of materials is another cause for poor design. A complete knowledge of the characteristics, applications and limitations will avoid their misuse and minimize the occurrence of failures.

Reliability is a concern for all departments of an organization involving all areas namely raw material and parts, conceptual and detailed engineering design, production, testing and quality control, product shipment and storage, installation operation and maintenance. Although, eliminating human errors is very difficult, but it is possible to minimize some of them by proper selection, training and orientation of personnel, standardization of production procedures, simplification of control schemes and other incentive measures.

Prof. Dr. A. G. Matani, is Ph.D. in Mechanical Engg, is presently working as a lecturer in Mechanical Deptt., Govt. College of Engg, Amravati-(MS). Previously he was associated with Govt. Polytechnic Amravati. He had industrial experience of 5 years and academic experience of 13 years. He is a recognized guide of Ph.D. in the Faculty of Engineering and Technology in Sant Gadge Baba Amravati University. His main areas of interest are: productivity, small-scale industries, management, energy conservation, environment management and prevention, and pollution related areas.

### **Reference book:**

Electrical India, Vol. 47 No. 1  
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