IMME Institute of Maintenance Management Education

DISTANCE CERTIFICATE EXECUTIVE DEVELOPMENT PROGRAMMES

OBJECTIVES

Distance Certificate Executive Development Programmes are designed for maintenance engineers, managers and technical personnel with a view to strengthen their managerial competence; enhance system capabilities & utilization; help achieving optimum maintenance performance; and, promote excellence in maintenance work.

The programmes are aimed at imparting systematic training in respective themes and help developing participants to implement better ideas for maintenance improvement in their work environments. These EDPs not only provide comprehensive learning of relevant topics but also help building new skills and talent for achieving higher economical efficiency in managing maintenance functions.

INTRODUCTION

IMME offers the following Executive Development Programmes as certificate courses through distance mode:

- **EDP-I** : Maintenance Cost Control and Spare Parts Management
- **EDP-II** : Planned Preventive and Predictive Maintenance Systems and Practices
- **EDP-III** : Machine Failure Analysis and Reliability & Maintainability Improvement
- **EDP-IV** : Creativity and Value Analysis for Maintenance Functions

Depending on individual requirements, candidates can register for one or more EDPs after paying the corresponding course fees.

DURATION

- Maximum: Six Months
- Minimum: Three Months

(Six months is the maximum permissible duration for the course completion. However, any candidate willing to complete the course in minimum period of three months is allowed).

PARTICIPATION

Maintenance engineers and techno-managerial personnel from different industries.

MODUS OPERANDI

Detailed programme study materials along with instructions and the relevant assignments are forwarded to the candidates after registration. Each candidate is required to complete the EDP assignments and forward his answer papers to IMME as per the stipulated schedule. The answers papers of the individual candidates are evaluated by IMME and the performance reports are prepared. Based on the performance evaluation criteria, the successful candidates are awarded EDP certificates.

COURSE COVERAGE

Detailed course coverage of each of the distance certificate executive development programmes is given below:

EDP-I : MAINTENANCE COST CONTROL AND SPARE PARTS MANAGEMENT

Introduction

- In present environment of global competitiveness, cost-effectiveness and cost control have become synonymous for success. Maintenance, including opportunity cost due to downtime, constitutes a major portion of controllable cost, and therefore achieving maintenance cost-effectiveness through proper and efficient management of maintenance function is of paramount significance for any industry as it directly influences the cost of production. In case of many organizations, maintenance resources are not utilized optimally, resulting into over maintenance, losses, wastage, delays, inefficiency, downtime, etc. Also there could be some important areas which remain neglected, and do not receive adequate attention or resource allocation, thus resulting into additional loss of profits. Broadly, total maintenance cost constitutes two major components – direct cost and indirect cost. While direct maintenance cost is able to find entry in the books of accounts, indirect maintenance cost usually finds no proper place to be accounted for. A timely small maintenance cost often results in higher savings. There are however various other factors that influence equipment life-cycle cost, plant productivity and consequently manufacturing costs. What you do and how you do in maintenance is of insignificant value if it's not cost-effective. Maintenance cost control not only means cutting down the roots of excessive costs but also to optimize the overall maintenance costs through meaningful efforts and action plans. The course aims to provide a better understanding of maintenance cost control in industry and the ways and means of achieving the same.

- Managing spare parts is mainly focused to reduce costs by way of ensuring optimum consumption and proper inventory control of various spare parts. Whereas high consumption of spare parts can be commonly recognized by way of rising cost of maintenance, the losses accountable to over-optimum spares inventory can be known only after proper analysis of inventory data. Often, many maintenance engineers do not precisely understand economical implications of under and over-stocking costs in their stores. Usually they lay ignorant of the inventory carrying cost in relation to certain items which are either over-stocked or remain unutilized for a longer duration of time. Spare part problems generally fall in the areas related to maintenance, purchase and store-keeping functions. The ailments of spares inventory get aggravated due to improper forecasts, generous indents, longer lead times, excessive consumption, emergency purchases, improper inventory control, cupboard inventory at shop-floor, etc. Effective spare parts management requires adequate planning, optimum stocking policies and proper inventory control procedures besides suitable plans and policies to ensure minimum consumption of various parts.

Programme Structure and Coverage

EDP-I is structured to include two main topics, namely 'Maintenance Cost Control' and 'Spare Parts Management'. The programme coverage is briefly mentioned as below:

- ***Maintenance Cost Control***

Maintenance Cost-effectiveness and Maintenance Cost Control, Role of Maintenance in Business Economics, Maintenance Productivity Improvement and Case Studies, Productive Maintenance Methods, Total Maintenance Cost Control Concept, Total Material Cost Control, Spare Parts Rebuilding, Maintenance Cost Reduction, Value Analysis to Reduce Cost, Role of Maintenance in Energy Conservation and Case Studies, etc.

- ***Spare Parts Management***

Problems in Spare Parts Management, Codification of Spare Parts, Maintenance Inventory Analysis and Selective Control – ABC, VED, SDE, HML, FSN and Other Analysis, Optimum Stocking Policies for Spare Parts, Assurance Levels for Spare Parts, Replenishment Systems, Spare Parts Planning, Reclamation of Parts and Economics, Management of Non-moving Inventory, Inventory Trend Analysis, etc.

- ***EDP-I Assignments***

Assignments are based on the programme topics, viz. 'Maintenance Cost Control' and 'Spare Parts Management'.

EDP – II : PLANNED PREVENTIVE AND PREDICTIVE MAINTENANCE SYSTEMS AND PRACTICES

Introduction

- Preventive maintenance system and practices followed in various industries usually entail substantial scope for improvement. The overall results realizing from planned preventive maintenance system employed in an industry greatly depend how well various resources deployed for maintenance functions work together in unison. Generally, however, there has been little appreciation for truly working on planned maintenance principles. In many industries, it can be revealed that planned preventive maintenance systems possess a loose ground and that there are certain gaps that hurdle in their effective performance. There are cases where it can be witnessed that planning function is either organized casually or inadequately, or schedules are encountered with numerous delays, or recording or analysis is not done properly, or control function is found missing or operates like a handicapped organ. The purpose of planned preventive maintenance system is to provide a favourable ground to

facilitate achieving desired maintenance goals; avoid undesirable interruptions to the production programme; ensure improvement in up time, productivity, quality & safety; reduction in delays, downtime & overall costs, etc. together with all-round improvement in maintenance performance.

- Predictive maintenance represents a diagnostic approach to plant maintenance to help taking timely action on the basis of realistic needs of maintenance. This practice is based on the objective checking of machine condition on a periodical basis and intended to provide quantitative measurement of wear and defects. Further, it's aimed to predict equipment problems and failures in advance not only to avoid breakdown maintenance but also unnecessary shutdowns which may be resulted due to fixed-time maintenance schedules. Predictive Maintenance certainly ensures substantial savings by eliminating maintenance work too late or too soon and therefore helps in protecting from the ill-effects of both over and under-maintenance. In distinct contrast to preventive maintenance, predictive maintenance makes use of a number of modern condition monitoring instruments to measure a whole range of parameters that prove detrimental to health & condition and performance of plant equipment and machinery. It's a new generation technique brought out to meet the challenges of reducing downtime to a greater extent. Proper integration of predictive maintenance practices with planned preventive maintenance systems ensures far more effective control on downtime of plant equipment and machinery.

Programme Structure and Coverage

EDP-II is structured to include two main topics, namely 'Planned Preventive Maintenance System and Practices' and 'Predictive Maintenance System and Practices'. The programme coverage is briefly mentioned as below:

- ***Planned Preventive Maintenance System and Practices***

The Maintenance Function, Effective Planned Lubrication, Effective Preventive Maintenance, Designing a Planned Maintenance System, Maintenance Work Order System, Maintenance Scheduling, Managing the Workload, Maintenance System for Monitoring and Controlling, Time to Attend Breakdowns: A Case Study, etc.

- ***Predictive Maintenance System and Practices***

Predictive Maintenance and Condition Monitoring Techniques – Ultrasonic Examination, Radiography, Thermography, Eddy Current Method, Magnetic Particle Examination, Liquid Penetrant Method, Spectrometric Oil Analysis Procedure (SOAP), Ferrographic Examination, Performance Trend Monitoring, Vibration Monitoring and Analysis, Shock Pulse Monitoring of Antifriction Bearings, Condition-based Predictive Maintenance: Examples and Cases, etc.

- ***EDP-II Assignments***

Assignments are based on the programme topics, viz. 'Planned Preventive Maintenance System and Practices' and 'Predictive Maintenance System and Practices'.

EDP-III: MACHINE FAILURE ANALYSIS AND RELIABILITY & MAINTAINABILITY IMPROVEMENT

Introduction

- Machine failure analysis and control programme can be organized properly only by way of systematic recording and analysis of failure data, such as nature of failures, modes, frequencies, criticality, causes, downtime losses, etc. and subsequently taking most suitable corrective actions on the basis of causes of failures to avoid any recurrence of the problems. Whereas it's comparatively easy to bring forth and witness bad effects of machine faults & failures, quite sometimes, difficult situations arise in establishing the right causes and prescribe the correct remedies. However, it's by way of establishing the root causes only that any problem can be solved permanently. The way the machine failure analysis and control programme is planned and organized by maintenance department – effectively or ineffectively – it shows a great influence on the downtime and the related costs. Maintenance department primarily owes responsibility for controlling downtime and the costs associated with it. The cost of downtime representing the loss of profit is often colossal and found varying in large proportions depending on the size of the plant. Even an increase or reduction in downtime by 1% in large plants often equates to a great amount of loss or profit respectively. The economical gains due to effective machine failure analysis and control programme can be sighted in substantial savings both in the direct and the indirect maintenance costs together with increased profitability for the company. Machine failure analysis and control programme can be organized properly only by way of systematic recording and analysis of failure data, such as nature of failures, modes, frequencies, criticality, causes, downtime losses, etc. Further, it requires planning suitable corrective actions to deal with the causes of failures. The way the failure analysis and control programme is planned and organized by the maintenance department greatly influences the downtime and the associated costs.

- For each machine, it's necessary that it maintains its trouble-free status for a desired period of time, as otherwise, if it shows an undesirable pattern of failures, it's said to be unreliable and results in production losses. On the other hand, if a machine consumes too much time in trouble-shooting, restoration or repair, its maintainability is considered poor which results in extended downtime. The problems of poor machine reliability and maintainability are mainly accountable to design problems, bad operation, poor maintenance skills & practices and unfavourable working environment. It's absolutely necessary for maintenance personnel to develop proper

understanding in relation to machine reliability and maintainability aspects. Reliability deals with trouble-free operation time of machines and how best it can be prolonged further. In other words, it means how to increase MTBF of plant and machinery. Maintainability however deals with the speed, economy and ease with which various maintenance & repair activities on different machines can be carried out. In other words, maintainability improvement is primarily focused on reducing MTTR of different machines. "Avoid the need of maintenance in the first place" and "Do maintenance efficiently when needed" are two fundamental principles representing importance of reliability and maintainability that ultimately determine availability of plant equipment and machinery. Reliability and maintainability factors are always considered critical in assuring higher availability, lower downtime and higher output from the plant equipment and machinery.

Programme Structure and Coverage

EDP-III is structured to include two main topics, namely 'Machine Failure Analysis and Control' and 'Machine Reliability and Maintainability Improvement'. The programme coverage is briefly mentioned as below:

- ***Machine Failure Analysis and Control***

Classification of Failures, Failure Causes, Losses Due to Failures, Essential Elements of Failure Analysis and Control, Approaches to Control Failures and Downtime, Techniques to Diagnose Machine Faults, Breakdown Analysis and Case Studies, Designing and Organizing Failure Analysis and Control Programme, Logical Techniques, Case Study on Failure Codification and Analysis, etc.

- ***Machine Reliability and Maintainability Improvement***

Machine Reliability, Maintainability & Availability Considerations, System Configuration and Analysis, Data Collection to Investigate Reliability and Maintainability, Estimation of MTBF and MTTR, Approaches to Improve Reliability and Maintainability, Case Studies on Reliability and Maintainability Improvement, etc.

- ***EDP-III Assignments***

Assignments are based on programme topics, viz. 'Machine Failure Analysis and Control' and 'Machine Reliability and Maintainability Improvement'.

EDP-IV: CREATIVITY AND VALUE ANALYSIS FOR MAINTENANCE FUNCTIONS

Introduction

- Creativity constitutes a precious attribute of all human resources. All people possess creative potential in some form or the other as a gift of nature and in most cases, a spark of creativity within a group of motivated people can bring about fruitful innovation and phenomenal change. Creative thinking goes with open mind and it does not necessarily require being genius to become a creative person. Though it often requires a special mind tuning to be able to tap one's own creative potential. Creativity is all about thinking freely without any blocks and boundaries to give birth to new and novel ideas – the ideas that can help solving a variety of problems and potentially contribute towards the growth and development in an organization. Training for creativity and problem-solving management is the necessity of all organizations and almost all levels of management. The need of nursing new think tanks to encourage evolution and implementation of better ideas provides key to continuous and unprecedented progress.

- Based on the concept of functional worth, value analysis is considered as an invaluable technique for cost reduction. Value analysis concept facilitates in evaluating and improving the function of an item v/s cost. Value analysis requires logical as well as creative techniques for developing useful alternatives. It's worthwhile to examine expenditure in an organization and to decide the people who generate costs. All these cost generating people should be involved in value analysis programme and pushed a bit to go beyond their normal habit solutions. Unnecessary costs need to be identified and removed to stimulate a progressive change.

Programme Structure and Coverage

EDP-IV is structured to include two main topics, namely 'Creativity for Problem-solving' and 'Value Analysis for Maintenance Functions'. The programme coverage is briefly mentioned as below:

- ***Creativity for Problem-solving***

Introduction to Creativity, How to Develop Your Creative Potential, Creative Thinking and Problem-solving Management, Roadblocks to Creative Ideas, Techniques for Generating Ideas, Brainstorming Techniques, Solving Engineering Problems, etc.

- ***Value Analysis for Maintenance Functions***

Value Analysis Concepts, Causes of Poor Value, Value Analysis for Reducing Costs, Value Analysis for Maintenance Functions, Questioning Techniques, Case Studies, etc.

- ***EDP-IV Assignments***

Assignments are based on programme topics, viz. 'Creativity for Problem-solving' and 'Value Analysis for Maintenance Functions'.

REGISTRATION DETAILS

To obtain registration details for Distance Certificate Executive Development Programmes, please mail to immeinstitute@gmail.com thereby giving your particulars, such as name, designation, company, address and mobile no.

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