



Institute of Maintenance Management Education



PRACTICE-ORIENTED DISTANCE COURSE IN MAINTENANCE MANAGEMENT



COURSE OBJECTIVES

This detailed training course is designed for maintenance engineers, managers and technical personnel with a view to add new dimensions to their skills and managerial competence; facilitate improvement of maintenance functions and productivity; assist in optimizing maintenance costs and promoting excellence in maintenance work activities in their plants.

The course is aimed at imparting practice-oriented training in maintenance management and help developing participants to a greater potential to implement a whole range of fruitful ideas for maintenance improvement in their work environments. The course provides most comprehensive, systematic learning of various topics to gain better understanding and new insights to pave way for higher economical efficiency in managing maintenance functions. The course involves a wide spectrum, in-depth learning, and facilitates in laying strong foundation for maintenance management.

INTRODUCTION

Maintenance effectiveness in a company finds a close relationship with all such factors that directly influence production, quality, costs and the overall economics. With a view to gain cost advantage and benefits of improved productivity, companies should continuously strive to achieve prominence in managing maintenance functions in their plants. Besides efficient maintenance & repair activities, it's imperative for maintenance engineers to know how effectively they utilize their resources and at what cost. They need to focus on effective planned maintenance systems & procedures, cost effective methods & practices, failure analysis, downtime reduction, overall equipment effectiveness, life cycle economics, productivity improvement, design improvements for higher reliability & maintainability, optimum spares inventory, energy conservation, elimination of various abnormalities, losses & wastage, reduction in total maintenance costs, etc. to name a few.

The way you perceive maintenance, the same way you get results in your plant. Are you conscious about the losses caused by various machine malfunctions, failures & downtime and inefficient utilization of maintenance material, labour, inventory & other resources in your plant? Are you equipped with proper and adequate knowledge of maintenance management to hold reins of your plant problems? Are you aware of the contribution of maintenance and the scope of reducing manufacturing cost in your plant and the ways and means of achieving it? Are you concerned about productive improvements of maintenance functions in your plant? Focus on trouble-free plant and total productivity improvement of all resources is, however, considered instrumental to attain world-class status.

The course is focused to enrich course candidates with in-depth knowledge, practical insight and all round skills in dealing with various problems related to maintenance functions and prepare them to work out a whole lot of fruitful ideas and suggestions to improve maintenance efficiency and effectiveness in their plants.

COURSE OUTLINES

The course incorporates 21 Training Packages as part of the course module, comprising of detailed study materials and practical assignments with focus on improving maintenance functions. Different Training Packages, included in the course, are noted below:

- Profitability, Productivity and Maintenance Management
- Basics and Broad Aspects of Maintenance – I
- Basics and Broad Aspects of Maintenance – II
- Tribology
- Work Study in Maintenance
- The Maintenance Function
- Lubrication Management and Practices
- Selective Approach in Maintenance
- Maintenance Organization
- Maintenance Planning and Scheduling
- Designing a Planned Maintenance System
- Predictive Maintenance
- Maintenance Budgeting, Costing and Cost Control
- Maintenance Information System, Performance Analysis and Control
- Reliability, Maintainability and Availability
- Equipment Replacement and Investment Analysis
- Machine Failure Analysis
- Machine Reconditioning/Rebuilding
- Value Analysis in Maintenance
- Safety in Maintenance
- Spare Parts Management

Broad coverage of different Training Packages can be referred in the following paragraphs.

BRIEF DETAILS OF THE COURSE COVERAGE

Training Course is comprehensively designed to include 21 training packages on different topics related to maintenance management with voluminous details covered in about two thousand five hundred pages. Main topics covered in different training packages are very briefly mentioned as below:

- **Profitability, Productivity and Maintenance Management (TP-1)**

Role of Maintenance in an Enterprise, Manufacturing Cost Components, Brief on Management, Managerial Functions – Planning, Organizing, Staffing, Directing & Controlling, Profitability and Rate of Return on Investment, Reasons for Low R.O.I., Increasing R.O.I., Concepts of Productivity, Wastage in Industry – Wastage in Maintenance Operations – Wastage of Lubricants, Gland Packings, Nuts and Bolts, Bearings & Many Other Items, Training for Effective Wastage Control, Ways to Increase Productivity – Basic Approaches, Measuring Increase in Productivity, Numerous Practical Cases of Productivity Improvement, Productivity of Human Resources, Maintenance Productivity, etc. and *TP-1 Assignments*.

- **Basics and Broad Aspects of Maintenance – I (TP-2)**

Introduction to Maintenance Management, Changing Patterns of Technology, Effect of High Technology Plants on Maintenance Function, Importance of Maintenance at Macro Level – World-wide Cost of Maintenance, Micro Level Importance, Characteristics of Maintenance, Attitudes Towards Maintenance Function, Production V/s Maintenance, National Maintenance Strategy, Human Element in Maintenance – Professional Manager, Role of Supervisors, Essence of Communications, Decision-making, Polyvalent Craftmanship, Performance of a Person, Motivational & Training Aspects, Effective Human Relations, Systems Approach to Maintenance, etc. and *TP-2 Assignments*.

- **Basics and Broad Aspects of Maintenance – II (TP-3)**

Equipment Deterioration and Need of Maintenance – Deterioration Due to Wear & Tear, Corrosion, Mal-operation & Misuse, Three Phases in Equipment Operation Cycle, Plant Availability – Definition & Methods for Calculating Machine Availability, Delay Factors, Plant Capacity Utilization – Cases of Process Plants, Engineering Units and Power Plants, Gap in Plant Availability and Capacity Utilization and Case History of Open Cast Mine, Cost of Maintenance – Elements of Maintenance Cost, Cost Ratio of Maintenance Materials to Maintenance Labour, Direct and Indirect Cost of Maintenance, Maintenance Cost Indices, New Dimensions in Maintenance – Plant Engineering, Tribology, Materials Technology, Terotechnology – Life-cycle and Life-cycle Costs, Cost of Ownership, Practice of Terotechnology and Customer-Supplier Relationship, Reducing Costs Through Terotechnology – Procurement of Plant Machinery and Equipment, Seller-Buyer Interface, LCC Process, Cost Breakdown Structuring and Cost Estimating, etc. and *TP-3 Assignments*.

- **Tribology and Its Application (TP-4)**

Background of Tribology, Nature of Metallic Surfaces, Surface Roughness, Two Surfaces in Contact, Sliding Friction – Laws of Friction, Limitations of Classical Laws, Fifth Law and Friction Phenomenon, General Laws of Friction – Sliding, Rolling and Fluid Frictions, Introduction to Wear, Adhesive Wear – Scuffing and Fretting, Abrasive Wear, Gouging Abrasion, Low Stress Abrasion, High Stress Abrasion (Grinding Abrasion), Erosion Abrasion, Abrasion Wear Rates and Surface Changing for Abrasion Resistance, Fatigue Wear – Cavitation Wear, Corrosive Wear, Practical Examples, Selection of Abrasion-resistant Materials, Other Considerations in Material Selection, Wear Reduction Measures – Improving Wear Resistance, Tribological Problems and Solutions, Principles of Lubrication, Hydrodynamic Lubrication, Hydrostatic Lubrication, Elasto-hydrodynamic Lubrication, Boundary Lubrication, Case of Bearing Failure, Survey of Tribological Practices in Industry, etc. and *TP-4 Assignments*.

- **Work Study in Maintenance (TP-5)**

Introduction to Work Study, Historical Background, Method Study – Outline Process Chart, Flow Process Chart, Two-handed Process Chart, Multiple Activity Chart, Flow Diagram and String Diagram, Critical Examination, Development and Installation of New Methods, Some Cases of Methods Improvement, Work Sampling Techniques, Maintenance Work Measurement and Development of Maintenance Time Standards – Need to Measure Maintenance Work, Techniques of Maintenance Work Measurement – Job Estimating, Statistical Analysis of Past Records, Time Study, Production Studies, Analytical Estimation, Work Sampling, Standard Data, PMTS and MTM, Application of Work Measurement Techniques to Develop Maintenance Time Standards, etc. and *TP-5 Assignments*.

- **The Maintenance Function (TP-6)**

Introduction to Maintenance Function, Maintenance Activities, Maintenance Trades, Operational and Cost Objectives, Structuring Maintenance Objectives, Setting Goals – Some Practical Examples, Maintenance Policies, Forms of Maintenance, Maintenance System, Benefits of Planned Maintenance System, Optimum Planned Maintenance, Numerous Maintenance Practices and Concepts – Planned and Unplanned Maintenance, Preventive Maintenance, Corrective Maintenance, Maintenance Prevention, Productive Maintenance, Operator Maintenance (Autonomous Maintenance), Functional Maintenance, Area Maintenance, Deferred Maintenance, Fixed Time Maintenance,

Opportunity Maintenance, Modular Maintenance, Assigned Maintenance, Scheduled Maintenance, Preventive Maintenance Concepts, Preventive Maintenance vis-à-vis Breakdown Maintenance, Impact of Breakdown Maintenance on Company's Profitability, Objectives of Preventive Maintenance, Preventive Maintenance Work Activities, Benefits of Preventive Maintenance Programme, Limitations of Preventive Maintenance, Effect of Planned Maintenance System on Downtime, etc. and *TP-6 Assignments*.

- **Lubrication Management and Practices (TP-7)**

Introduction, Historical Background, Lubrication – An Important Function of Maintenance, Purpose of Lubrication, Classification of Lubricants, Characteristics of Lubricating Oils – Viscosity, Viscosity Index, Flash Point and Fire Point, Pour Point and Cloud Point, Carbon Residue, Resistance to Oxidation, Thermal Stability, Resistance to Foaming and Emulsification, Additives – Detergents, Antifoam, Antirust/ Anticorrosion Inhibitors, Antioxidizers, Extreme Pressure Additives, Pour Point Depressants, Emulsifying Agents, Emulsion Breakers, Oiliness Additives & Viscosity Improvers, Categories of Lubricating Oils – Turbine Grade Oils, Hydraulic Oils, Automotive Engine Oils, Gear Oils, Machine Oils, Spindle Oils & Refrigeration Oils, Selection of Lubricating Oils, Lubricating Greases, Categories of Greases – Soap Base Greases – Calcium Soap Greases, Sodium Soap Greases, Lithium Soap Greases and Non-soap Base Greases, Characteristics of Greases – Penetration or Consistency, Drop Point, Heat Stability, Oxidation Stability, Selection of Lubricating Greases, Greasing Practices, Lubrication Methods, Characteristics of Lubricating Devices and Systems, Planned Lubrication, Lubrication Survey, Standardization of Lubricants, Organizing Planned Lubrication, Lubricant Storage and Handling, Control of Lubrication Costs, etc. and *TP-7 Assignments*.

- **Selective Approach in Maintenance (TP-8)**

Equipment Categorization, Categorization Plan, Deciding Factors, Deciding Weightages for the Selected Factors, Deciding Degrees for the Factors, Evaluation of Equipment Criticality, Selective Maintenance Policy – Most Critical, Critical and Important Equipments, Equipment Categorization Cases – Case of a Cement Plant, Case of an Engineering Industry, Case of a Process Plant, Case of a Sugar Plant, Case of a Paper Plant, Case of Ceramic Industry, Case of Mining Industry, Case of Engineering Process Industry, Case of a Heavy Chemical Industry, Case of Hydro-electric Power Station, Case of a Textile Mill, etc. and *TP-8 Assignments*.

- **Maintenance Organization (TP-9)**

Necessity and Requirements of an Overall Effective Organization, Formal and Informal Organizations, Types of Organizations – Line Organization, Functional Organization, Line & Staff Organization, Distinction in Line and Staff Functions, Principles of Management, Delegation, Problems in Delegation, Span of Control, Decentralization, Difference in Delegation and Decentralization, Design of Overall Organization Structure, Important Principles of Organization, Factors Affecting Organization Structure, Process of Organization, Types of Maintenance Organizations – Centralized, Decentralized, Combined Centralized-Decentralized Organization, Matrix Organization, Maintenance Organizational Analysis and Effective Maintenance Organization, Maintenance Organization vis-à-vis Overall Organization, Internal Maintenance Organization, Ways to Organize Specialist Groups, Review of Maintenance Organization, Position or Job Description, etc. and *TP-9 Assignments*.

- **Maintenance Planning and Scheduling (TP-10)**

Concepts of Planning, Benefits of Planning, Features of Planning Function, Requisites of Effective Maintenance Planning, Classification of Maintenance Plans, Elements of Maintenance Planning, Building Maintenance Planning – Building Maintenance Tasks, Master Plan for Building Maintenance and Priorities in Planning, Contract Maintenance Planning – Nature of Maintenance Work, Volume of Maintenance Work, Life-cycle of Plant Equipment, Industrial Relations and Contract Maintenance Cost, Facilities Planning, Planning for Expansion, Planning Plant Turnarounds, Maintenance Scheduling – Gantt Charts, Network Techniques – PERT/CPM, etc. and *TP-10 Assignments*.

- **Designing A Planned Maintenance System (TP-11)**

Introduction, Mechanics of a Planned Maintenance System, Systematic Approach in Designing Planned Maintenance System, Inventory of Facilities, Codification of Facilities, Selection of Facilities for Planned Maintenance, Facility Records, Survey of Facilities, Equipment Correction List, Preparation of Master Checklists – Master Lubrication Checklists, Master Inspection Checklists, Standard Procedures, Job Instruction Cards, Preparation of Master Schedules, Manpower Estimation, Planned Maintenance Paper Work – Equipment History Card, Work Order, Inspection Reports/Records, Maintenance Manuals, Implementation of Planned Maintenance System and Difficulties, etc. and *TP-11 Assignments*.

- **Predictive Maintenance (TP-12)**

Introduction, Subjective V/s Objective Checking, Aim of Condition-based Maintenance, Condition Monitoring Techniques – Static Monitoring – Non-destructive Testing (NDT) Techniques, Ultrasonic Examination, Radiography, Thermography, Eddy Current Method, Magnetic Particle Examination, Liquid Penetrant Method, Acoustic Emission Technique, Visual Inspection Techniques – Temperature Indicating Devices, Industrial Stethoscopes, Stroboscopes, Optical Inspection Instruments, Boroscopes, Endoscopes, Inspection Mirrors, Fibrescopes, CCTV, Special Purpose Inspection Methods – Crack Detection, Leak Detection, Corrosion Monitoring, Contaminant Examination – Debris Analysis, Spectrometric Oil Analysis Procedure (SOAP), Ferrographic Examination, Performance Trend Monitoring, Dynamic Analysis – Vibration Monitoring and Analysis, Shock Pulse Monitoring, Designing a Vibration Monitoring System, Vibration Trouble Shooting Charts, Initial Planning for Condition-based Maintenance System, etc. and *TP-12 Assignments*.

- **Maintenance Budgeting, Costing and Cost Control (TP-13)**

Introduction, Advantages, Disadvantages and Problems in Budgeting, Essentials of Budgeting, Maintenance Budgeting, Planning and Presenting Maintenance Budget, Factors Influencing Maintenance Budget, Preparation of Maintenance Budget – Production Schedule Approach, Labour Allocation Approach, Integrated Approach, Maintenance Costing, Case of Maintenance Costing System, Cost Codes for Maintenance Activities, Booking of Maintenance Costs, Budgetary Control, Z-charts for Budgetary Control, Maintenance Cost Control, etc. and *TP-13 Assignments*.

- **Maintenance Information System, Performance Analysis and Control (TP-14)**

Concept of Control Function – Essentials of a Control System, Control of Maintenance Function, Objectives, Maintenance Efficiency, Effectiveness and Productivity Relationship, Reservations and Difficulties in Maintenance Control, Measurement of Maintenance Performance, Maintenance Performance Measurement Based on Numerous Indices, Limitations of Different Indices, Trend Analysis, Nippon Denso Method, Newbrough's Method, Corder's Maintenance Efficiency Index Method, Multi-stage Indicator Method, Multi-index Profile Method, Multi-factor Graph Method, Maintenance Audit, Maintenance Information System, etc. and *TP-14 Assignments*.

- **Reliability, Maintainability and Availability (TP-15)**

Introduction to Reliability, Maintainability and Availability, Reliability and Total Life-cycle Costs, Reliability Definition, Reliability & Quality, Reliability Description, Factors Affecting Reliability, Reliability and Exponential Failure Law, Probability of Survival, Failure Rate, Mean Time Between Failures (MTBF), Reliability of a System – Series, Parallel and Mixed Configurations, Redundancy, Parallel & Standby Redundancy, Computation of Machine Failure Rates and Mean Time Between Failures (MTBF), Statistical Distributions, Reliability Prediction, Maintainability Concepts – Mean Time To Repair (MTTR), Design Considerations – Maintainability Prediction, Factors Affecting Maintainability – Design and Installation Factors, Reliability, Maintainability and Availability Relationship – Inherent Availability V/s Acquisition Cost, Effectiveness of a System, Approaches to Improve Reliability, Maintainability and Availability, etc. and *TP-15 Assignments*.

- **Equipment Replacement and Investment Analysis (TP-16)**

Introduction, Need for Equipment Replacement, Provision of Assets, Concepts in Equipment Procurement Programme, Replacement Decisions, Investment Analysis – Time Value of Money, Compound Interest Factors, Quantitative Methods – Factors for Consideration – Service Life, Salvage value, Interest Rate, Rate of Return or Payback Period, Depreciation, Obsolescence, Tax, Insurance, Inflation, Annual Cost Method, Present Worth Method, Return on Investment Method, Discounted Cash Flow Method, Payback Period Method, Concept of Sunk Costs, MAPI Formula, Concept of Economic Life, Role of Maintenance in Plant Selection, Reliability and Maintainability Assessment of New Plant Equipment, Design Audit, Terotechnology in Plant Selection, Requirements of Purchase Contract – General Guidelines for Preparation of Plant Specifications, Contract Terms & Conditions, Equipment Installation and Commissioning, etc. and *TP-16 Assignments*.

- **Machine Failure Analysis (TP-17)**

Classification of Failures, Failure Terminology, Fundamental Causes of Failures, Systematic Failure Analysis Programme, Detection of Faults/Failures – Trouble Shooting Charts, Fault Tree Analysis, Fault Location Logic Diagrams, Design-in and Design-out Maintenance, Mechanical Failures and Their Prevention – Fatigue Failure, Failure of Welded Joints, Brittle Fracture, Creep Failure, Common Electrical Problems and Their Prevention, Corrosion Failures and Cost of Corrosion, Corrosion Phenomenon – Mechanism of Corrosion, Forms of Corrosion, Corrosion of Building Materials, Corrosion Prevention – Modification in Materials and Design Specifications, Use of Protective

Coatings, Change in Environmental Conditions, Corrosion Inhibitors, Electrochemical Protection – Cathodic Protection and Cases, Anodic Protection, Selection of Corrosion Control Techniques, Organizing Failure Analysis Programme – Reporting and Recording of Failure Data, Codification of Failures, Analysis of Failures – Modes, Frequencies, Downtime, Criticality, Causes, etc. and *TP-17 Assignments*.

- **Machine Reconditioning/Rebuilding (TP-18)**

Introduction, Needs, Benefits and Limitations of Machine Reconditioning/Rebuilding, Economics of Reconditioning – Replacement V/s Reconditioning, Methods for Evaluating Economics, Maintenance and Repair Welding – Basic Steps, Eutectic Welding, Weldability, Surface Preparation, Preheating, Postweld Heat Treatment, Stress Relief, Preheating V/s Postheating and Surface Finishing, Typical Cases, Welding of Cast Iron and Dissimilar Materials, Reclamation of Worn and Damaged Parts – Repair of Surface Cracks, Insitu Repair Welding and Cases, Surfacing and Hard Facing, Surfacing Techniques – Powder Feeding Method, Metallizing Process, Flame Plating Method, Reclamation by Machining Processes, Metalock Method, Planned Reclamation Programme and Implementation, etc. and *TP-18 Assignments*.

- **Value Analysis in Maintenance Functions (TP-19)**

Introduction, VA Definitions, Objectives & Benefits, Concept of Value – Use, Cost, Esteem & Exchange Values, Expression of Value, Comparison of Values, Terotechnology and Value Engineering & Value Analysis, Value Analysis Techniques – Defining Functions, Questioning Techniques, VA Checklists, Approach and Attitudes, Organizing Value Analysis Programmes – Selection of Projects, Job Plan – Information, Definition, Search, Evaluation and Execution Phases, Team Approach, VA Cases in Maintenance – Wire Ropes, Gland Packings, EOT Cranes, etc. and *TP-19 Assignments*.

- **Safety in Maintenance (TP-20)**

Introduction, Causes of Accidents, Patterns of Accidents, Equipment Design and Safety, Role of Maintenance in Plant Safety, Basic Approach to Accident Prevention, Training and Motivation of Workers, Role of Supervisors, General Safety Guidelines, Concept of Total Loss Control, Risk Management – Identification of Risks, Assessment of Risks, Control of Risks, Disaster Planning, Controlling Industrial Hazards – Mechanical Hazards, Electrical Hazards – Static Electricity, Equipment Grounding, Toxic, Physical & Fire Hazards, Personal Protective Equipment, Organizing Safety Programmes – Safety Policy, Support of Top Management, Safety Organization, Safety Rules and Regulations, Communication Channels and Involvement of Employees, Safety Training, Safety Committees, Suggestion Schemes, Safety Audit and Correction of Safety Defects, Safety Appraisal, Accident Investigation, Equipment Damage Report, Safety in Maintenance Work, etc. and *TP-20 Assignments*.

- **Spare Parts Management (TP-21)**

Introduction, Objectives and Functions of Inventory Control, Problems with Maintenance Stores, Consumption Patterns of Spare Parts, Classification of Maintenance Inventory, Maintenance Inventory Analysis and Selective Control – ABC, VED, SDE, HML, FSN and Other Analysis, Replenishing Systems – Ordering Cost, Inventory Carrying Cost, Order Quantity, Various Ordering Systems and Suitability for Spare Parts, Poisson's Distribution, Stocking Policies for Regular Items, Assurance Levels and Safety Stocks, Stocking Policies for Irregular Items – Capital & Insurance Spares, Spares Planning, Stores Organization, Codification of Parts, Records and Paper Work, Stores Layout, Location Addresses, Standardization/Variety Reduction, Management of Scrap, Obsolete and Surplus Items, Management of Non-moving Inventory (XYZ Analysis), Trends of Inventory, etc. and *TP-21 Assignments*.

MODUS OPERANDI OF THE COURSE

Training Course is comprehensively designed to include 21 Training Packages along with assignment on different topics related to maintenance management with voluminous details covered in about two thousand five hundred pages. Each course candidate receives 21 Training Packages along with course instructions after registration. On periodic basis, candidates send back their answer papers on the course assignments to IMME for evaluation. For any meaningful clarifications, course candidates can interact with the faculty through e-mail. Finally, based on the performance evaluation, successful candidates are awarded certificates of competence in maintenance management.

PARTICIPATION

Maintenance engineers, technical executives, engineering supervisors, techno-managerial personnel, etc. from various industries.

DURATION

- Maximum: One Year
- Minimum: Six Months

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

REGISTRATION DETAILS

To obtain registration details for Practice-oriented Distance Course in Maintenance Management, please mail to immeinstitute@gmail.com thereby giving your particulars, such as name, designation, company, address and mobile no.

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EXCELLENCE IN TRAINING FOR OVER 30 YEARS

CLIENTS FOR PRACTICE-ORIENTED DISTANCE COURSE IN MAINTENANCE MANAGEMENT

Tens of Thousands of candidates from a large number of reputed companies in the corporate sector have participated in different training programmes & courses conducted by IMME in a period of over 30 years.

Some of the companies who have participated in the Practice-oriented Distance Course in Maintenance Management are shown below:

Ador Powerton Limited
Alembic Chemical Works Co. Ltd.

Alembic Glass Industries Ltd.
Amrit Banaspati Co. Ltd.
Andhra Cement Limited

Anil Starch Products Ltd., The
Arihant Spinning Mills
Aruna Sugars Ltd.
Ashok Leyland Ltd.
Asian Bearings Ltd.
Asian Cables & Industries Ltd.
Asian Paints (India) Ltd.
Assam Carbon Products Ltd.
Associated Alcohol & Breweries
Ltd.

Associated Cement Cos. Ltd.
Atlas Copco (India) Ltd.
Autokast Limited
(A Govt. of Kerala Undertaking)
Bajaj Electricals Ltd.
Balmer Lawrie & Co. Ltd.
(A Govt. of India Enterprise)
Barium Chemicals Ltd.
Bata India Ltd.
Bazpur Co-operative Sugar
Factory Ltd.

Bhagwati Foundries Ltd.
Bharat Explosives Ltd.
Bharat Gears Limited
Bharat Petroleum Corpn. Ltd.
(A Govt. of India Enterprise)
Bhoruka Aluminium Ltd.
Bhoruka Steel Limited
Bihar Caustic &
Chemicals Ltd.
Bihar State Sugar Corpn. Ltd.
Birla Cement Works
Bombay Dyeing & Mfg.
Co. Ltd., The
Brakes India Ltd.
CFL Pharmaceuticals Ltd.
Cabot India Ltd.
Cadbury India Limited
Camphor & Allied
Products Ltd.
Carborundum Universal Ltd.
Carrier Aircon Limited
Cellulose Products of India Ltd.
Century Spg. & Mfg. Co. Ltd.
Chemfab Alkalis Limited
Chennai Port Trust
Chirala Co-op. Spinning
Mills Ltd., The
Chitavalsah Jute Mills
Coromandel Cements Ltd.
Cosmo Ferrites Limited

Cosmo Films Ltd.
Crompton Greaves Ltd.
DCM Textiles
DCW Limited
Damodar Valley Corporation
Deepak Fertilisers &
Petrochemicals Corpn. Ltd.
Deepak Nitrite Ltd.
Denso India Ltd.
Dhampur Sugar Mills Ltd.
Dharamsi Morarji Chemical
Co. Ltd., The
Diamines and Chemicals Ltd.
Diamond Cements
Drillco Metal Carbides Ltd.
Durgapur Projects Ltd., The
(A Govt. of West Bengal
Undertaking)
E.I.D. Parry (India) Ltd.
Echjay Industries Limited
Eicher Tractors
Electro Steel Castings Ltd.
Eltex Super Castings Ltd.
Esab India Limited
Escorts Limited
Ester Industries Limited
Eveready Industries India Ltd.
Excel Industries Ltd.
Exide Industries Limited
Facor Alloys Limited
Fenner (India) Limited
Forbes & Company Ltd.
GSL (India) Ltd.
Gabriel India Ltd.
Gajra Bevel Gears Ltd.
Garware Polyester Ltd.
Gharda Chemicals Ltd.
Godrej & Boyce Mfg. Co. Ltd.
Gontermann-Peipers (India) Ltd.
Goodlass Nerolac Paints Ltd.
Graphite India Ltd.
Grasim Industries Ltd.
Gujarat Poly-AVX Electronics
Ltd.
HEG Limited
Haryana Sheet Glass Ltd.
Hilton Rubber Ltd.
Hindalco Industries Ltd.
(Renusagar Power Division)
Hindustan Construction Co. Ltd.,
The
Hindustan Gas & Industries Ltd.
Hindustan umilever Limited
Hindustan Motors Limited
Hindustan Petroleum Corpn. Ltd.
(A Govt. of India Enterprise)
Hyderabad Industries Ltd.
ITC Limited

Inarco Limited
Incab Industries Limited
India Glycols Limited
India Pistons Limited
Indian Charge Chrome Ltd.
Indian Farmers Fertiliser
Co-operative Ltd.
Indian Ordnance Factories
(Ministry of Defence –
Govt. of India)
Indian Smelting & Refining
Company Ltd., The
Indian Sugar & General
Engineering Corporation
Indo Rama Synthetics (I) Ltd.
Indoco Remedies Limited
Indiapistons-Repco Limited
Ingersoll Rand (India) Ltd.
JK White Cement Works
Jain Irrigation Systems Ltd.
Jyoti Limited
K.C.P. Limited, The
Kalyani Seamless Tubes Ltd.
Kalyani Spinning Mills Ltd.
(A Govt. of West Bengal
Undertaking)
Kalyani Steels Ltd.
Kandla Port Trust
Kesoram Industries Ltd.
Kesoram Rayon
Kirloskar Brothers Ltd.
Kirloskar Electric Co. Ltd.
Kirloskar Pneumatic Co. Ltd.
Lakshmi Machine Works Ltd.
Larsen & Toubro Limited
Lohia Starlinger Limited
Lucas-TVS Ltd.
Lyka Labs Limited
M.J. Pharmaceuticals Ltd.
MRF Limited
Maharashtra Seamless Ltd.
Mahindra & Mahindra Ltd.
Mineral Exploration Corpn. Ltd.
Motor Industries Co. Ltd.
Mysore Paper Mills Ltd.
Nagarjuna Fertilizers & Chemicals
Ltd.
Neycer India Limited
Nuclear Power Corporation of
India Ltd.
(A Govt. of India Enterprise)
Orient Cement
Orient General Industries Ltd.
Orient Paper Mills
Oswal Spg. & Wvg. Mills Ltd.
Paharpur Cooling Towers Ltd.
Panyam Cements and Mineral
Industries Ltd.

Phillips Carbon Black Ltd.
Premier Breweries Limited
Pudumjee Pulp & Paper Mills Ltd.
Punjab Khand Udyog Ltd.
Punjab Maize Products Ltd.
Rajashree Polyfil
(A Divn. of Century Enka Ltd.)
Rallis India Limited
Ralson (India) Limited
Ranbaxy Laboratories Ltd.
Raunaq Automotive Components
Ltd.
Reckitt Benckiser (India) Ltd.
Regency Ceramics Ltd.
Reliance Industries Limited
Reliance Jute & Industries Ltd.
S.R.P. Tools Ltd.
STP Limited
Saurashtra Cement & Chemical
Industries Ltd.
Shaw Wallace Gelatines Ltd.
Shree Madhi Vibhag S.S.K. Ltd.
Siemens Limited
Sirpur Paper Mills Ltd., The
Standard Pharmaceuticals Ltd.
Steel Tubes of India Ltd.
Steelcast Limited
Sterlite Technologies Limited
Stumpp, Schuele & Somappa Ltd.
Sudarshan Chemical Industries
Ltd.
Sulzer Pumps India Ltd.
Sun Pharmaceutical Industries
Ltd.
Sundram Fasteners Ltd.
Sunflag Iron & Steel Co. Ltd.

Supreme Paper Mills Ltd.
Surya Roshni Limited
TTK – LIG Limited
Tarapur Cables (India) Ltd.
Tata Chemicals Limited
Tata Metaliks Ltd.
Tega Industries Ltd.
Thermax Limited
Thiru Arooran Sugars Ltd.
Traco Cable Company Ltd.
(A Govt. of Kerala Undertaking)
Travancore Titanium Products
Ltd.
Tuticorin Spinning Mills Ltd.
USV Limited
Universal Cables Ltd.
Upper Ganges Sugar & Industries
Ltd.
Utkal Asbestos Limited
V.I.P. Industries Ltd.
Vadilal Industries Ltd.
Vardhman Polytex Ltd.
Vindhya Telelinks Limited
Voltas Limited
Warren Tea Limited
Welcast Steel Limited
Wheels India Limited
Wimco Limited
Wipro Limited
Wires and Fabriks (S.A.) Ltd.
Wockhardt Health Care Limited
XLO Machine Tools Ltd.
Yashwant Iron & Steel Works Ltd.
Zandu Pharmaceutical Works Ltd.
Zenith Limited