

*List of Fast Track Multi Media
training Programs*

**FOR HIGHER PROFITABILITY ,
PERFORMANCE AND PRODUCTIVITY OF
ORGANIZATIONS**



TSI

**Programs Designed by
Dr.G.G.Rajan - Kochi - India**

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PROFITABILITY MANAGEMENT FOR INDUSTRIES

WHO SHOULD ATTEND ?

CODE

0000.01

This intensive program is intended for **Senior Managers, Executives and Decision makers** in Petroleum, Petrochemical, Fertilizer, Power and other process industries who are keen to maximize the profitability of their enterprise.

OBJECTIVE

Participants will be trained to

- ❖ Analyze the profit and cost centers of enterprises
- ❖ Identify key areas for control
- ❖ Identify and evaluate alternatives
- ❖ Carry out 'what if' analysis and scenario building
- ❖ Develop performance models for their industry for achieving maximum profitability for their enterprise.

At the end of the program, participants will be able to apply Strategic Planning and other managerial tools which will maximize their profitability.

COURSE CONTENT

**DURATION
TWO DAYS**

This program is based on Resource Analysis, Resource Management, Quantitative Techniques and Decision Making.

Business Environment and Analysis

- ❖ Four M's of Management
- ❖ Productivity and Resources Utilization
- ❖ Resource Mix and Optimization
- ❖ Technical factors of Production

Profitability Planning

- ❖ Parato's Model applied to industries
- ❖ Profit / Cost Centres approach

- ❖ Productivity and profitability improvement
- ❖ Cost Analysis – ‘hands-on ‘ training.
- ❖ Identifying key factors of profitability
- ❖ Constraints analysis

Production vs Profitability planning

- ❖ Demand forecast
- ❖ Production capacity and capability
- ❖ Impact of capacity utilization on profitability
- ❖ Impact of machine productivity / modernization on profitability
- ❖ Human productivity and profitability

Modeling applications for improving profitability of enterprises.

- ❖ Performance models
- ❖ Process mix optimization
- ❖ LP/NLP/Dynamic model applications for profit maximization
- ❖ Scientific modeling approach to profit maximization

Technical Factors

- ❖ Case study on Plant productivity and profitability
- ❖ Impact of capacity utilization on profitability
- ❖ Impact of feed quality, operating parameters etc on profitability
- ❖ Process mix / technology / Energy efficiency on profit margin
- ❖ Typical case studies
- ❖ Impact of maintenance and equipment reliability
- ❖ Failure analysis - case studies

Quantitative techniques / Decision models for profit maximization

- ❖ Equipment replacement / maintenance decisions
- ❖ Retrofit / revamp / grass-root construction decisions
- ❖ Operations analysis of a process by computer models
- ❖ Profit maximization algorithm for complex processes.
- ❖ Discussion and summing up

Course Director / Venue / Date / Fee including software Profimax
Dr G.G.Rajan

For registration and more info contact

*Hari Sree,
Sanskrit College Rd
Tripunithura.Kochi.Kerala
India - 682 302.
Email:ggr@md3.vsnl.net.in*

COMPUTER-AIDED ENERGY MANAGEMENT FOR INDUSTRIES

WHO SHOULD ATTEND ?

CODE

0000.02

This intensive program is intended for **Operation Managers, Executives, Process Engineers, Energy Managers, Energy Auditors, Energy Consultants and Energy equipment manufacturers** working in Petroleum, Petrochemical, Fertilizer, Power and other process industries who are keen to maximize the energy efficiency of the total system and minimize energy bills.

OBJECTIVE

To appraise the industrial personnel on

- ❖ Role of Energy Management
- ❖ Energy cost-reduction techniques
- ❖ Energy efficiency monitoring techniques
- ❖ Energy efficiency evaluation using programs
- ❖ 'What-if' analysis and Scenario building
- ❖ Energy performance modeling
- ❖ Equipment replacement / maintenance decisions using the models
- ❖ Training the personnel on day-to-day monitoring
- ❖ Analyze total system and identify energy cost and control centers of enterprises and key control areas
- ❖ Develop appropriate energy management system and an effective monitoring methodology
- ❖ Identify the impact of operating parameters on energy efficiency of the system for remedial action

At the end of the program, participants will be able to apply Energy Management techniques for their system/subsystem/equipment to achieve high energy efficiency.

COURSE CONTENT

**DURATION
FOUR DAYS**

This program is based on Energy System Analysis, Energy Performance Modeling and Simulation, Scientific Modeling and 'what if ' analysis using Quantitative Techniques and Decision Making.

Energy Management

- ❖ Energy Scenario
- ❖ Energy Demand forecasting of future.
- ❖ Energy and environment
- ❖ Energy Conservation techniques
- ❖ Role of the Energy Manager

Computer-Aided Energy Management

- ❖ Basics and Theory - TSI Expert
- ❖ CEM Program Organization
- ❖ Techniques of Energy Management
- ❖ Case Studies

Energy Utilization concepts

- ❖ Energy Cost - Impact on industrial profitability.
- ❖ Energy efficiency evaluation of systems, subsystems - input / output Method.
- ❖ Computer-aided efficiency evaluation – ‘ hands-on training ‘

Case study

- ❖ Technological impact on Energy consumption
- ❖ Energy efficiency improvement methods - process industries
- ❖ Energy conservation economics - evaluation of alternates
- ❖ Computer-aided Evaluation of Energy Systems
- ❖ Energy Economic Decision Making

Case Study

- ❖ Computer-aided Energy Evaluation for process plants
- ❖ Energy factor method / Customization technique
- ❖ Flexi-targeting concept – Effective Energy Management tool.
- ❖ Computer-aided ‘flexi-targeting’ method – case study.

Energy Cost Centres - identification.

- ❖ Energy efficiency improvement – evaluation of options
 - ❖ ‘Computer-aided Alternates selection ‘ - economic criteria.
-

Computerization for Energy Management

- ❖ Energy Data base design – ‘Hands-on’ training.
- ❖ Identifying Energy Cost Centres and Ranking methods
- ❖ Development of monitoring methodology
- ❖ Energy Management Decisions
- ❖ Equipment Replacement / Maintenance Decisions.
- ❖ Computer aided optimization – Case Study.

Parato’s Theory

- ❖ Application to Energy Management.
- ❖ Case Study – A refining Unit
- ❖ ‘Hands-on’ training using CEM software.

Heater Efficiency Evaluation

- ❖ Conventional Method
- ❖ Direct Method
- ❖ Computer-Aided Efficiency evaluation – ‘hands-on’ training.
- ❖ Energy Losses evaluation and time dependent efficiency model for heaters

Boiler efficiency

- ❖ Evaluation by direct and indirect methods
- ❖ Energy loss analysis of boilers and techniques of improvement
- ❖ Computer-aided efficiency evaluation – ‘hands-on’ training
- ❖ Time dependent boiler efficiency model
- ❖ Economic evaluation of operating efficiency

Industrial application of Turbines

- ❖ Turbine efficiency evaluation – case studies.
 - ❖ Computer-aided turbine efficiency evaluation – ‘hands-on’ training.
 - ❖ ‘What-if’ Analysis using turbine operating model.
 - ❖ Economic evaluation of turbine operation.
-

Energy Performance Models

- ❖ Benefits of using CEM models.
- ❖ Integrating models to operation / operational decisions.
- ❖ Decision support system capabilities of CEM
- ❖ Energy Management Decisions
- ❖ Case Studies – ‘hands-on ‘ training

Compressors

- ❖ Energy efficiency of compressors
- ❖ Computer-aided evaluation of compressor efficiency
- ❖ Compressor efficiency models
- ❖ Monitoring compressor performance
- ❖ Economic impact of delayed decisions
- ❖ Case studies

Theory of Insulation

- ❖ Energy Loss Estimation techniques
- ❖ Computer-aided Energy loss evaluation – ‘hands-on’ training.
- ❖ Optimal insulation thickness determination
- ❖ Insulation efficiency model and monitoring

Steam System

- ❖ Steam losses determination / quantification
- ❖ Combined Heat-Power cycle and it's impact on operating cost
- ❖ Steam system efficiency determination
- ❖ Monitoring steam consumption centres
- ❖ Steam consumption models

Electrical System

- ❖ Monitoring electrical system efficiency and losses
- ❖ Power factor improvement techniques
- ❖ Electrical system optimization
- ❖ Case studies

Energy mix optimization

- ❖ Impact of energy mix on operating cost
 - ❖ Energy mix model
 - ❖ Case study – discussion
 - ❖ Controllable / uncontrollable losses
-

Modern Energy conservation techniques

- ❖ Case studies – discussion
- ❖ Evaluation of ENCON schemes – ‘hands-on’ training
- ❖ Low-temperature heat recovery options
- ❖ Economic evaluation – case studies

Capabilities of Computer-aided Energy Management

- ❖ Benefits
- ❖ Decision support system - application
- ❖ Performance monitoring – application
- ❖ Equipment replacement / maintenance decisions
- ❖ Establishing maintenance program for plant efficiency
- ❖ Corporate level monitoring application
- ❖ National level monitoring application
- ❖ Trouble shooting application

Discussion and summing-up of the program

Course Director / Venue / Date / Fee including software Techno Therm

Dr G.G.Rajan

For registration and more info contact

*Hari Sree,
Sanskrit College Rd
Tripunithura.Kochi.Kerala
India - 682 302.
Email:ggr@md3.vsnl.net.in*

OPERATIONS MANAGEMENT - PRODUCTION PLANNING AND ECONOMIC ANALYSIS

WHO SHOULD ATTEND ?

CODE

0000.03

This intensive program is intended for **Operation Managers, Production Planning Engineers, Process Engineers, Optimization Group Engineers, Financial Executives and Decision makers** working in Petroleum Refining / Petrochemical industry and who needs to understand the technical and economic factors which control the profitability of the industry.

OBJECTIVE

This program covers

- ❖ An overview of Refining / Petrochemical Technology
- ❖ Economic considerations involved in Refining and petrochemical Operation
- ❖ Identifying operational constraints
- ❖ Impact of feed mix, process mix and operating parameters on profitability
- ❖ Carry out 'what if' analysis and scenario building
- ❖ Optimization of operations using PC based software Techno Plan and Linear / Non-Linear / EORT models

At the end of the program, participants will be able to apply Strategic Production Planning and other managerial tools which will maximize their net back.

COURSE CONTENT

DURATION
3 DAYS

This program is based on Crude work-up, Process Design, Quantitative Techniques and Modeling.

Refinery / Petrochemical Configuration / Technology

- ❖ Major Refining / petrochemical Processes
- ❖ Process objectives
- ❖ Feed and Product streams / Product pattern
- ❖ Technical factors of Production
- ❖ Cost of operation and impact of process parameters
- ❖ Typical case studies

Economics of Operation

- ❖ Product value at plant battery limit
- ❖ Calculation of net back
- ❖ Impact of severity of operation
- ❖ Feed mix effect
- ❖ Case study

Feed Stock Selection

- ❖ Unit wise material balance
- ❖ Unit costing
- ❖ Exercises in evaluation

Unit wise production planning

- ❖ Impact of capacity utilization
- ❖ Impact of operating severity
- ❖ Unit wise yield prediction using models
- ❖ Shut down plans

Product blending

- ❖ Linear programming fundamentals
- ❖ Application to product blends
- ❖ Exercises

Production planning

- ❖ Demand analysis
- ❖ Forecasting
- ❖ Production pattern and demand pattern
- ❖ LP modeling for production
- ❖ Evaluation of alternates

Production control

- ❖ Performance monitoring of processes
- ❖ Utility consumption models
- ❖ Operation analysis
- ❖ Profit maximization model
- ❖ Inventory carrying cost

Discussion and summing-up of the program

Course Director / Venue / Date / Fee including software Techno Plan

Dr G.G.Rajan

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Performance Monitoring of Industries

WHO SHOULD ATTEND ?

CODE

0000.04

This intensive program is intended for Senior Managers, Operations Managers, Production Executives and Decision makers in Petroleum, Petrochemical, Fertilizer, Power and other process industries who are keen to monitor and maximize the productivity of their enterprise.

OBJECTIVE

To help chemical, refinery and petrochemical personnel to

- Understand the fundamentals of Performance Monitoring
- Identify key areas for control
- Identify cost / profit centers and constraints
- Carry out 'what if' analysis and scenario building
- Understand various methods of performance measurement
- Develop performance target setting
- Develop performance management and implementation strategies

At the end of the program, participants will be able to apply managerial tools which will maximize their performance and profitability.

COURSE CONTENT

**DURATION
TWO DAYS**

This program is based on System / Subsystem/ Resource Analysis, Resource Management, Quantitative Techniques and Decision Making.

Performance Monitoring – An overview

- Objectives / benefits of performance monitoring
- Performance measurement tools
- Performance Analysis methods
- Technical factors of Production
- Performance target setting and developing production plan

Process Monitoring

Subsystem performance
Profit / Cost Centres approach
Productivity and profitability improvement
Cost Analysis – ‘hands-on ‘ training.
Identifying key factors of profitability
Constraints analysis

Production vs Profitability planning

Demand forecast
Production capacity and capability
Impact of capacity utilization on profitability
Impact of machine productivity / modernization on profitability
Human productivity and profitability

Modeling applications for improving profitability of enterprises.

Production Planning model
Overall production performance model
Unitwise performance model
Costing model
Optimal production model
Hands on training using SCIMOD applications

Discussion & summing up.

Course Director : Dr G.G.Rajan

Computer-aided Project Management

WHO SHOULD ATTEND ?

CODE

0000.05

This intensive program is intended for Senior Managers, Executives and Decision makers in Petroleum, Petrochemical, Fertilizer, Power and other process industries involved in Project Evaluation, Selection, Implementation , Monitoring and Control .

OBJECTIVE

Participants will be trained to

- ❖ Carry out product demand analysis
- ❖ Identify viable projects
- ❖ Evaluate alternatives on financial parameters
- ❖ Carry out ‘what if’ analysis and scenario building
- ❖ Evaluate project performance and avert cost / time over runs by optimal resource mix for achieving high performance level.
- ❖ Avert project disasters
- ❖ Trouble shoot sick industries and develop retrofit schemes more effectively in compliance with stipulated financial norms
- ❖ Overcome competition by strategic project plans

At the end of the program, participants will be able to apply Strategic Planning and other managerial tools which will maximize the project performance..

COURSE CONTENT

DURATION
TWO DAYS

This program is based on Resource Analysis, Demand Management, Quantitative Techniques , Project Appraisal and Project Decision Making techniques.

Business Environment and Demand Analysis

- ❖ Identifying Product Demand and Demand Analysis
- ❖ Financial Impact
- ❖ Make-Buy decisions and project evaluation
- ❖ Alternates selection / Strategic project planning.

Project Planning – computer applications

- ❖ Need for a project
- ❖ Technical factors in project selection.
- ❖ Project Attributes analysis
- ❖ Identifying alternates .
- ❖ Evaluation and selection of alternates.
- ❖ SWOT Analysis of projects

Project Analysis and implementation decisions.

- ❖ Capital mix and investment decisions
- ❖ Project strategies
- ❖ Project Activities
- ❖ Reducing project execution time.
- ❖ Impact of Time and Cost over runs on project performance.

Project Performance – Conventional vs Computer Models .

- ❖ Project Performance models
- ❖ Evaluation methods
- ❖ Identifying lead / lag factors
- ❖ Strategies for improvement of project performance
- ❖ Improving financial performance.

Project Appraisal system

- ❖ Financial Analysis
- ❖ Impact of capacity utilization on profitability
- ❖ Internal Rate of Return, Internal Rate of Return on Investment
- ❖ Net present value, Profitability index of projects
- ❖ Impact of Process mix / capital mix on financial performance
- ❖ Typical case studies
- ❖ Project disasters - case studies

Quantitative techniques / Decision models for project appraisal system

- ❖ Equipment replacement / maintenance decisions
- ❖ Retrofit / revamp / grass-root construction decisions
- ❖ Performance analysis of projects by computer models
- ❖ Application software – **Technopas - Exercise**
- ❖ **Discussion and summing up**

Course Director : Dr G.G.Rajan

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India - 682 302.
Email:ggr@md3.vsnl.net.in*

Environment, Health and Safety Management for the process Industry

WHO SHOULD ATTEND ?

CODE

0000.06

This intensive program on Environment / Health / Safety Management is intended for Operations staff , Managers, Senior Managers , Executives, safety & fire engineers and Decision makers who are involved in operation, maintenance , project , process and monitoring activities working in Petroleum, Petrochemical, Fertilizer, Power and other process industries.

OBJECTIVE

Participants will be trained to

- ❖ Identify environmental factors and their impact on health and safety.
- ❖ Improve environment / health / safety standards
- ❖ Avert loss of life / equipment / plant and machinery.
- ❖ Protect environment and avert toxic disposal of effluents and emissions
- ❖ Carry out environment / health / safety audits.
- ❖ Implement recommendation of audit findings and monitor the same .

At the end of the program, participants will be able to apply these techniques in real life situations and ultimately improve safety standards.

COURSE CONTENT

DURATION 3 DAYS

This program is based on Environment / Health / Safety standards and procedures adopted by various international organizations and their experience.

Industrial Environment

- ❖ Why EHS management ?
- ❖ Inter links Environment / Health / Safety
- ❖ Environmental parameters and their impact on health and safety.
- ❖ Environmental protection methods.

Environmental Management

- ❖ Air pollution / Water Pollution / Ambient air quality / solid wastes
- ❖ Toxic emissions / control methods
- ❖ Environmental Impact on safety of personnel / plant life
- ❖ Case Studies

Health Management

- ❖ Industrial Health monitoring
- ❖ Mandatory health parameters and impact of plant environment
- ❖ Toxicity levels and tests
- ❖ Acquired diseases control

Safety Management

- ❖ Who is responsible for safety ?
- ❖ Safety triangle concept
- ❖ Environmental safety – identification of methods / norms
- ❖ Personnel safety
- ❖ Plant safety
- ❖ Safety appliances

Safety Audit

- ❖ Process safety
- ❖ Equipment safety / operational safety
- ❖ Failure analysis
- ❖ Fault tree concept
- ❖ Accident analysis – case studies
- ❖ Code of practice
- ❖ Impact of reliability studies / maintenance management on safety

Accidents

- ❖ Types
- ❖ Fire accidents – role of fire engineers
- ❖ Explosions
- ❖ Industrial analysis / prevention
- ❖ Precautions

Disaster control plan

- ❖ Organization
- ❖ Communication system

- ❖ Action plan

Tools for safety management

- ❖ Reliability studies
- ❖ Cause analysis – work permit system / procedures
- ❖ Hazop studies
- ❖ ‘what-if’ analysis / scenario building
- ❖ safety organization

Rules / regulations

- ❖ Monitoring / implementation
- ❖ ISO 9001 and safety procedures
- ❖ Case studies

Demo of EHS management applications

Discussion & summing up.

Course Director

Dr G.G.Rajan

For registration and more info contact

*Hari Sree,
Sanskrit College Rd
Tripunithura.Kochi.Kerala
India - 682 302.
Email:ggr@md3.vsnl.net.in*

Fundamentals of Petroleum Refining Technology

WHO SHOULD ATTEND ?

CODE

0000.07

This intensive program on Fundamentals of Petroleum Refining Technology is intended to offer the technical information for fresh graduates, trainee engineers, operators, plant engineers, safety & fire engineers and Decision involved in operation, maintenance, project, process and monitoring activities working in Petroleum Processing Industry.

OBJECTIVE

Participants will be trained to understand

- ❖ About crude oil, characteristics, properties, yield evaluation, Distillation curves, process economics etc.
- ❖ About Primary refining Principles, Operation, Trouble shooting
- ❖ Secondary Processing technology and their applications.
- ❖ Product up gradation, value addition, quality improvement processes and their cost/benefit analysis.
- ❖ Chemical / Physical treatment methods and their application.
- ❖ Optimizing methods for process mix to achieve the desired products at minimum cost and maximize profit margin.
- ❖ Utility Management for refining industry
- ❖ Waste water treatment / environmental management for the refining industry.
- ❖ Energy efficiency management in refining industry.

At the end of the program, participants will be able to apply these techniques in real life situations and ultimately improve process performance standards and improve their operation skills.

COURSE CONTENT

DURATION 5 days

This program on Fundamentals of Refining Technology of five days duration is based on the course content of various international organizations of repute and their experience.

This program is designed by experts who have over 37 years of 'Hands-on' experience and expertise in petroleum refining at various levels and capacities. This is a crash training program that could be used by organizations for immediate placement of trainees in refining units directly.

Crude Petroleum

- ❖ Occurrence , Consumption Pattern, Economic growth
- ❖ Crude Assay / Evaluation / Classification
- ❖ Characteristics of petroleum / Evaluation methods
- ❖ Processing Technology / Choice of Process Mix / Process Economics
- ❖ Technology for meeting product specifications and environmental parameters.
- ❖ Product specifications , laboratory tests , impact on performance / environment.

Distillation Principle

- ❖ Atmospheric Distillation Unit – Theory and Operation principles
- ❖ Vacuum distillation unit – Theory and operation.
- ❖ Control Parameters for distillation units
- ❖ Unit upsets and trouble shooting
- ❖ 'Dos and Don't Dos'
- ❖ Case Studies

Conversion Processes I

- ❖ Thermal Process
- ❖ Catalytic Process
- ❖ Delayed coking
- ❖ Fluid Coking
- ❖ Coil Visbreaking
- ❖ Soaker Visbreaking
- ❖ Yield pattern from conversion process
- ❖ Operational economics

Fluid Catalytic Cracking

- ❖ Catalytic cracking - principles
- ❖ Fluid catalytic cracking
- ❖ Selection of catalysts for FCCU and Economic evaluation
- ❖ Monitoring methods for catalyst performance.
- ❖ Cycle time evaluation by models

Product Quality Improvement

- ❖ Chemical treatments
- ❖ Amine treatment process
- ❖ Merox treatment process
- ❖ Hydro treatment
- ❖ Naphtha / Kerosene / Diesel Hydro treatment process
- ❖ Sulfur Recovery process
- ❖ Operation and trouble shooting hydro treater problems.
- ❖ Optimal cycle length and economics of operation.

Conversion Process II

- ❖ Catalytic Reforming Process
- ❖ Thermal Reforming Process
- ❖ Alkylation Process
- ❖ Isomerisation Process
- ❖ Yield pattern determination

Refinery Utility Management

- ❖ Steam and Power Generation Plants and Their operation.
- ❖ Air System
- ❖ Efficient boiler operation
- ❖ Efficient turbine operation
- ❖ Concept of combined heat power cycle
- ❖ Instrument / Industrial Air Quality Management

Environmental Management

- ❖ Refinery waste water system
- ❖ Control parameters
- ❖ Air / Water / Solids Pollution and control methods
- ❖ Environmental Disaster control plan
- ❖ Refinery safety

Refinery Utilities II

- ❖ Nitrogen Production
- ❖ Desalination of sea water
- ❖ Purification of waste water and zero effluent discharge

Off site facilities

- ❖ Tank form operation
- ❖ Refinery Material Balance
- ❖ Loss control strategies

Process Flow diagrams

Discussion & summing up.

Course Director

Dr G.G.Rajan

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LINEAR PROGRAMMING APPLICATIONS FOR OPERATIONS PLANNING & CONTROL

WHO SHOULD ATTEND ?

CODE

0000.08

This is a specialized training program for all the Managerial staff, supply planners, refinery production coordinators, oil economists and personnel in charge of supply, planning, programmes, product blending and production / process engineers.

OBJECTIVE

Participants will be trained to understand the concepts of Refinery operations Planning and the economics of optimal operation with respect to the demand pattern. The participants will also learn the basics of Linear Programming and its application to refinery operation with a view to maximize the gross margin compatible with the plant constraints. This is a very unique and specialized program and the participants should have a knowledge of hydro carbon properties, blending and costing.

This training program will provide an in-depth understanding of the techniques used for decision making in operations and planning concerning supply and refining.

Participants will gain a working knowledge of planning techniques, from preparation of optimal monthly programmes up to daily operations scheduling.

Emphasis is put on the economic environment of the industry (market, prices, etc.) and on the extent of the validity and limits of the different approaches.

COURSE CONTENT

DURATION 5 DAYS

09.00 to 17.00 hrs

This programme is planned for five days and will cover complete LP applications. Some part of NLP and Modeling aspects related to planning will also be covered in the intensive 'hands-on' training programme. Participating organizations will greatly benefit in terms of higher profitability, performance and productivity. The trained participants will be capable of taking quantitative decisions after attending this program.

COURSE CONTENT

Introduction

- ❖ Refinery margins and their volatility
- ❖ Markets and prices of crude oils and petroleum products
- ❖ Physical markets
- ❖ introduction to the need for hedging and to future markets
Refining costs.
- ❖ Refining margins versus refining costs

Linear Programming (Monthly Programme)

- ❖ Basics of Linear Programming:
 - the simplex algorithm
 - graphic interpretation
 - optimum properties
 - analysis of marginal costs
 - range, parameterisation
 - sensitivity analysis
- ❖ Introduction to refinery modelling:
 - material balances (processes, product balances, blends)
 - products specifications
 - utilities consumption
 - objective function: cost or profit

Syndicate work on a cracking refinery: work includes writing of a LP model, optimization through use of a computer optimization software, analysis of the optimum solution, of validity limits.
- ❖ Impact of new market constraints or changes in the environmental regulations.
Syndicate work on transportation modeling
- ❖ additional case study considering a second refinery and the supply of several bulk plants.
- ❖ Overview of other applications:
 - multiperiodic model
 - refinery utilities balance
 - oil industry planning tools (matrix generator, LP optimiser, report writer)

❖ Practical Management Of Operations

- Operational calculations: syndicate work on supply planning problems
- Crude oil evaluation
- Process severity optimization
- Product quality cost
- From the monthly programme to the scheduling of operations
- Study of typical sequential constraints
Review of scheduling problems
Control of results
- Practical application in a refinery
Overview of practical tools and of the different approaches within the refining industry
Syndicate work on case studies, derived from actual refinery situations, will enable non-experts to gain the necessary experience for immediate application.

DATE AND VENUE : To be set based on client/participant preference.

COURSE DIRECTOR:

Dr.G.G.Rajan (A specialist in quantitative decision making)

For more information or registration details, please [contact us](#).

Dr.G.G.Rajan
Hari Sree
Sanskrit College Road
Tripunithura. Ernakulam
Kerala – India – 682 301
Ph: 0091 484 2782 158
Fax : 0091 484 2782 158
Email: ggrajan@vsnl.com

QUANTITATIVE DECISION MAKING TECHNIQUES FOR MANAGEMENT OF PETROLEUM WELLS

WHO SHOULD ATTEND ?

CODE

0000.09

This is a specialized training program for all the production managers, engineers, operators, mechanical, electrical and drilling engineering staff and chief of operations working in petroleum oil production on shore / off shore.

OBJECTIVE

The objective of this program is to train the production staff on the application of quantitative techniques for Petroleum production maximization, developing Production forecasts, Oil well performance analysis, Well costing, Enhanced oil recovery impact, Down stream unit performance monitoring, Loss control, Continue / Abandon decisions, Well potential, Selection of alternates etc

COURSE CONTENT

DURATION 3 DAYS

- ❖ BASIC PETROLEUM GEOLOGY
- ❖ ESTIMATING OIL & GAS IN RESERVOIRS
- ❖ BASIN ANALYSIS MODELS
- ❖ SEISMIC DATA ACQUISITION / PROCESSING / INTERPRETATION
- ❖ OIL & GAS PRODUCTION PLANNING
- ❖ WELL LOG DATA
- ❖ OIL / GAS PRODUCTION POTENTIAL MODELS
- ❖ CONTINUE / ABANDON DECISIONS
- ❖ OPTIMIZING OIL WELL PRODUCTION FOR PROFIT MAXIMIZATION
- ❖ MODEL BASED PRODUCTION PLANNING

- ❖ LOSS CONTROL
- ❖ ENHANCED OIL RECOVERY METHODS
- ❖ PRODUCTION ECONOMICS.

DATE AND VENUE : To be set based on client/participant preference.

COURSE DIRECTOR:

Dr.G.G.Rajan (A specialist in quantitative decision making)

For more information or registration details, please [contact us](#).

Dr.G.G.Rajan
Hari Sree
Sanskrit College Road
Tripunithura. Ernakulam
Kerala – India – 682 301
Ph: 0091 484 2782 158
Fax : 0091 484 2782 158
Email: ggrajan@vsnl.com

SIX SIGMA APPROACH TO INCREASE PRODUCTIVITY, PERFORMANCE AND PROFITABILITY OF ENTERPRISE

WHO SHOULD ATTEND ?

CODE

0000.10

This is a *specialized training program* for all Decision makers such as CEOs, Directors, EDs,GMs,DGMs,CMs from Operation and Maintenance, Finance, Materials, Human Resources, Planning and Control, Corporate Planning Departments etc of any Production / Services / Consultancy who are involved in the Decision Making Process of their section / organization at micro and macro levels..

OBJECTIVE

The objective of this program is to train the executives heading their organization / section / units to INCREASE Productivity, Performance and Profitability by the most versatile Quantitative Techniques and the latest Six Sigma technique, which is the most powerful CEO's tool . Participating Executives will be trained to translate business objectives to bring about revolution of improvements using quantitative resources management exercises, by case studies related to selected fortune 500 companies. This programme covers a wide range of topics and executives from any section of the organization will be imparted intensive training on Quantitative Decision Making Techniques. *The multi media training programme is unique of it's kind, never conducted before in it's coverage, style and effectiveness.*

COURSE CONTENT

DURATION 2 DAYS

- ❖ SIX SIGMA AND IT'S APPLICATION TO BUSINESS STRATEGY
- ❖ SIX SIGMA APPLICATION IN PRODUCTION UNITS
- ❖ SIX SIGMA APPROACH TO ENTERPRISE PROFITABILITY
- ❖ EXISTING ENTERPRISE PERFORMANCE
- ❖ POST SIX SIGMA PERFORMANCE (CASE STUDY)
- ❖ SUCCESS STORIES
- ❖ BENCH MARKING OF ENTERPRISE PERFORMANCE BY SIX SIGMA

- ❖ FINANCIAL PERFORMANCE BY SIX SIGMA
- ❖ GAP ANALYSIS
- ❖ ORGANIZATIONAL IMPROVEMENTS BY SIX SIGMA
- ❖ LEADERSHIP FOR SIX SIGMA
- ❖ COST-BENEFIT ANALYSIS OF SIX SIGMA.

DATE AND VENUE : To be set based on client/participant preference.

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MAINTENANCE MANAGEMENT and EQUIPMENT MAINTENANCE - BASICS

WHO SHOULD ATTEND ?

CODE

0000.11

Graduate engineers , trainees, supervisory staff, operations and maintenance personnel working in the process industries, petroleum, petrochemical, fertilizer and power plants and who are involved in maintenance , maintenance planning , contracting, equipment procurement, installation, testing etc. It is also suited to staff responsible for production costs, consequently for maintenance costs and in equipment availability control.

OBJECTIVE

The objective of this training module is to illustrate the developments occurring in maintenance theory and practices, equipment availability and reliability concepts, and their impact on competitiveness. The main aspects covered are: definition of progress targets, maintenance planning, overall cost of failure, staff motivation and performance rating. The program will also cover the basics of various equipment like pumps, compressors, turbines, boilers, heaters, motors, piping, valves, fittings etc and their Operation and maintenance.

On completion of the course participants will be:

- ❖ Familiar with current trends in Operation & Maintenance of equipment static and dynamic.
- ❖ Troubleshoot O&M problems and take corrective actions
- ❖ Capable of taking equipment maintenance / replacement decisions
- ❖ Evaluate the performance of existing machines in terms of operating cost, failure rates, maintenance cost etc quantitatively.
- ❖ Able to set O&M targets in terms of overall efficiency within the maintenance constraints
- ❖ Able to carry out reliability analysis and improvement studies without being a specialist

- ❖ Able to understand the conditions for successful management of major shut-downs
- ❖ Capable of determining a sub-contracting policy.

COURSE CONTENT

DURATION 5 DAYS

Maintenance Policy and Objectives

Maintenance and plant functions
Financial, technical and human objectives.

Current trends:

TPM, intensive subcontracting, internal contracts.

Means to adapt to given situation

Condition-based, preventive and corrective maintenance methods and their respective importance.

Conditions for effective implementation.

Necessity for each method and its limitations.

Maintenance work management: approval circuits, safety management, degrees of urgency and their control.

Evaluating and Monitoring Reliability

Descriptive statistics: reliability/reliability indicators, equip. performance monitoring in terms of availability.

MTBF, MTTR,..

Statistical functions and their applications.

Mathematical laws, applications of Weibull's law to systematic preventive maintenance, equipment redundancy study, standby machinery policy.

Pareto's law, identification of bad actors.

Reliability Analysis and Improvement Techniques

Failure trees.

Purpose of the method.

Application.

Reliability centered maintenance.

Use of decision logic.

Detection/elimination of concealed failures.

Maintenance Costs and Failure Costs

Responsibility sharing.

Life cycle cost.

Limitations of the practical use of this type of calculation in maintenance.

Operation & Maintenance Practices related to

Pumps

Compressors

Turbines

Heaters /Boilers

Heat Exchangers

Reboilers

Columns / Vessels / Tanks

Pipe lines (Liquid & Gas Service)

Maintenance Decisions

Overall failure cost, inefficiency cost.

Cost factors.

Synthetic efficiency ratios, necessary adaptation to chemical/petrochemical industries.

Practical calculation.

Performance monitoring.

Subcontracting

Purpose, conditions for efficiency.

Why contract work out, what knowhow to retain, how to control.

Diff. types of contract.

Quality assurance and safety.

Choosing firms, audits, partnerships.

Recent experience.

Responsibilities and regulatory aspects.

Illegal subcontracting.

Prerogatives of each party.

Impact on the behaviour of corporate personnel.

Shutdown Management

Detailed preparation.

Permanent cost control.

Planning.

Identification of critical operations.

Work management.

Work site organisation.

Responsibilities.

Decision-making.

Safety in Maintenance

Quality assurance/ safety.
Procedures.
Reports and updates.

Progress Plans

From failure management to equipment management.
Lowering the tolerance threshold for discrepancies and operator participation.
Different levels of organisation.
Committees.
Progress circles.
Responsibilities.

Maintenance programmes per equipment item and per equipment type.

The time factor and the human factor.
Rationalising inspection and spacing out shutdowns.
Progress indicators.
Maintenance audits.
Self-rating.

Computer aided maintenance management

To make it more concrete, the course includes numerous applications and case studies illustrating the techniques studied and the topics discussed. The teaching method is interactive and draws on participants' own experience. Specialists from industry speak about their personal innovations and progress they have achieved.

DATE AND VENUE

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Training Faculty for the Program.

Mr C.K.Thomas . Graduate Mechanical Engineer. 29 years of Mechanical Engineering Experience in Operation, maintenance, trouble shooting and project implementation in India and abroad. He has worked in KNPC, ARAMCO etc in maintenance and training.

CORROSION AND CORROSION PREVENTION – BASICS

WHO SHOULD ATTEND ?

CODE

0000.12

Graduate engineers , trainees, supervisory staff, operations and maintenance personnel working in the oil and gas industries such as petroleum, petrochemical, fertilizer and power plants and who are involved in operation,, maintenance, project engineering, equipment selection , procurement , installation, testing etc. It is also suited to staff responsible for costing engineering .

OBJECTIVE

The objective of this training module is to improve participants' knowledge of corrosion of metal elements integrated in industrial equipment. On completing this training session participants will - know the main characteristics and types of corrosion encountered in the metal materials used in the chemicals and oil and gas industries and be aware of the means of protection against such corrosion . Participants will know how to take the necessary measures for monitoring the state of corrosion of the equipment and control the corrosion rate and prolong equipment life scientifically.

COURSE CONTENT

DURATION 3 DAYS

Definition and Mechanisms of Corrosion

Ferrous and non-ferrous metals: structure, composition, mechanical properties.

Definitions: wet corrosion, dry corrosion.

Cost of corrosion: financial and human.

The basics: Electrochemical mechanisms - Polarization - Passivity - Diffusion.

Frequently Encountered Forms of Corrosion

Analysis of the origin and development process of each form of corrosion and possible methods of prevention.

Forms of corrosion studied: uniform, galvanic, pitting, crevice, intergranular, selective, corrosion-erosion and cavitation, stress corrosion, contact corrosion.

Forms of Corrosion Occurring in the Chemicals and Oiland Gas Industries

Each type of corrosion is studied together with possible remedial treatment.

Particular forms of corrosion encountered in industrial installations:

Hydrogen and hydrogen sulphide

- ❖ Stack gas corrosion
- ❖ Naphthenic acid corrosion
- ❖ Corrosion in a topping unit
- ❖ Polythionic acid corrosion
- ❖ Caustic soda corrosion
- ❖ Corrosion in an aqueous environment
- ❖ Atmospheric corrosion or corrosion by sea water
- ❖ High temperatures corrosion
- ❖ Liquid ammonia or of reinforced concrete corrosion.

Corrosion Specific to the Chemicals Industry:

- ❖ Corrosion by mineral acids, bases, nitrates, ammonia or chlorine.
Case studies of corrosion observed in process industry units
- ❖ Identification of the form of corrosion and suggested remedial treatment.

Corrosion Prevention

Design of equipment aimed at avoiding certain types of corrosion.

Choice of the materials best suited to the environment.

Corrosion inhibitors, filming, passivating, neutralizing, absorbing the oxygen.

Anti-corrosion coatings and systems. / Cathodic protection - sacrificial anodes / imposed current.

Methodology and control of processes. Control of process and environmental parameters.

Studies on the means of prevention implemented in the units.

Corrosion Monitoring – Computer aided corrosion control

Corrosion coupons and probes / Non-destructive testing of the state of walls.

Corrosion monitoring plan.

Active teaching methods are used to promote a pooling of experience.

The various themes are illustrated by colour photos or samples

Theoretical knowledge is assimilated and put into practice through case studies with the collaboration of specialists from industry.

DATE AND VENUE

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ELECTRICAL SYSTEMS – THEORY / OPERATION AND MAINTENANCE - BASICS

WHO SHOULD ATTEND ?

CODE

0000.13

Graduate engineers , trainees, supervisory staff, operations and maintenance personnel working in the oil and gas industries such as petroleum, petrochemical, fertilizer and power plants and who are involved in electrical systems operation,, maintenance, project engineering, equipment selection , procurement , installation, testing etc. It is also suited to staff responsible for costing engineering .

OBJECTIVE

The objective of this training module is to improve participants' knowledge of electrical systems, theory of electrical devices , operation and maintenance of these devices commonly used in the industry.. On completing this training session participants will have a thorough knowledge of electrical systems, equipment, their operation and maintenance. Participants will know how to take the necessary measures for monitoring the electrical equipment performance and control electrical equipment failures by appropriate measures..

COURSE CONTENT

DURATION 3 DAYS

- ❖ **Definition and Mechanisms of Electricity / Power Generation.**
- ❖ **Systems approach to Electricity Generation and Power Generation Economics**
- ❖ **Electricity Generation – Methods / Cost effectiveness**
- ❖ **Electrical Energy Accounting , monitoring and control**
- ❖ **Electricity Transmission methods**
- ❖ **Power Factor – concept . It's impact on Energy Consumption**
- ❖ **Electrical Load calculation for complex industries.**
- ❖ **Transmission Losses , measurement and control**

- ❖ **Electrical Energy Audit and Maintenance Decisions**
- ❖ **Electric Motors and Starters – types / characteristics**
- ❖ **Trouble shooting Motor Problems – Model Applications**
- ❖ **Pumps and Fans**
- ❖ **Variable speed drives**
- ❖ **Electric heating**
- ❖ **Lighting – optimization methods**
- ❖ **Compressed air – Power requirement for transportation**
- ❖ **Power requirement for Trans continent pipe line transfer of products (liquids / gases)**
- ❖ **Refrigeration and Air conditioning – basics / power requirement**
- ❖ **Power plant -Cooling Towers**
- ❖ **Turbines / turbo generators – for power generation – basics**
- ❖ **Gas turbines for power generation – principles / practice**
- ❖ **Power demand and power factor control**
- ❖ **Transformers – operating principles & practice**
- ❖ **Transmission losses**
- ❖ **Co-generation – basics**
- ❖ **Case studies.**

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Training Faculty for the Program

Mr.Mani – 35 yrs of experience in electrical systems design, operation, maintenance and trouble shooting in Oil Industry in India and Abroad.

BASIC INSTRUMENTATION FOR INDUSTRIES THEORY AND PRACTICE

WHO SHOULD ATTEND ?

CODE

0000.14

Graduate engineers , trainees, supervisory staff, operations , maintenance and instrumentation personnel working in the oil and gas industries such as petroleum, petrochemical, fertilizer and power plants and who are involved in instrument systems operation,, maintenance, project engineering, instrument selection , procurement , installation, testing etc. It is also suited to staff responsible for costing engineering .

OBJECTIVE

The objective of this training module is to improve participants' knowledge of instrumentation systems, theory of various instrument devices , operation and maintenance of these devices commonly used in the industry.. On completing this training session participants will have a thorough knowledge of instrument systems, control principles, their operation and maintenance. Participants will know how to take the necessary measures for monitoring the instrument system performance and control instrument failures by appropriate measures..

COURSE CONTENT

DURATION 3 DAYS

THE CONTROL LOOP

- ❖ Operation and component elements
- ❖ Tags and symbols
- ❖ Pneumatic and electric power supply

OPERATION AND TUNING OF MEASURING DEVICES AND CONTROL VALVES

Sensors and transmission system

- ❖ Accuracy and tuning of measuring devices
- ❖ Temperature measurement
- ❖ Pressure measurement

- ❖ Flow measurement
- ❖ Level measurement: devices, differential pressure cells
- ❖ Two-position sensors; safety devices, position sensors, temperature and pressure sensors
- ❖ Pneumatic transmitters
- ❖ Transformation of force into a pneumatic signal, amplification
- ❖ Electric and electronic transmitters
- ❖ Digital and teleprogrammable transmitters

Control valves

- ❖ Technology, operation, tuning
- ❖ Safety positions
- ❖ Main types

OPERATION AND IMPLEMENTATION OF PID CONTROLLERS

- ❖ Stability, performance and tuning of a PID controller
- ❖ Tuning methods with rough identification
- ❖ Accuracy – stability – non linearity
- ❖ Case of large dead – time
- ❖ Need to downgrade the quality of response of some loops to improve process stability

Tuning a PID controller

- ❖ Control loop characteristics
- ❖ Visualization of open loop controller responses
- ❖ Trial and error tuning of a closed loop PID controller
- ❖ Changing the Set Point, disturbances
- ❖ Practice in tuning may be included if a dynamic simulator is available

Design of PID control loops

- ❖ Simple loops, cascade control systems, split-range combinations, fractionation, dead band, P2 etc.

- ❖ Calculated variable and feed forward control system

PID control limits

- ❖ Advantages and disadvantages of possible improvements with: feedforward calculated variable, decoupling, self-adapting controllers

Multivariable Control theory

- ❖ Process model (different representations)
- ❖ Reference model

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Fax : 0091 484 2782 158

Email: ggrajan@vsnl.com

Training Faculty for the Program

Mr.Subramanian – 30 yrs of experience in electronic / pneumatic instrumentation systems design, operation, maintenance and trouble shooting in many industries.

DR.G.G.RAJAN



Dr.G.G.Rajan is a Doctorate in chemical engineering, having 36 year of industrial experience in Petroleum, Petrochemical and fertilizer units in various levels and capacities.

He is also a qualified specialist in

Operations Research

Computer-applications and Systems

programming besides Business management, mathematics and statistics.

Dr.Rajan has published / presented around 150 papers in International / National forums in India and abroad. He had developed a number of process performance models of day to day use for process industries with specific applications.He has authored a book titled ‘**Optimizing Energy Efficiencies in Industry**’ published by **TATA McGraw Hill Publications, New Delhi, India** and re-published by **McGraw Hill, USA** due to the innovative concepts presented in the unique book. This book has a five star rating by reviewers. He had won the first prize in a National Level competition on ‘**Cost effectiveness in the refining sector** ‘ where he has applied business resource management concepts using the application software tools developed by him.

He is currently a consultant for many Industries in India and abroad and has improved the performance of many industries based on his **Productivity / Profitability Enhancement models**. He is also the **Director (technical) , Techno Software International (Indian Subsidiary) , Kochi, India.**

He had been the head of a joint energy auditing team in 1990s to audit three refineries in South India and had carried out a number of technical audits in fertilizer, Petro chemical and power plants.

He is also a panel specialist in r-t-o-l Q&A forum on process and Association of Energy Engineers, USA . His thesis titled ‘ **Computer – applications and Decision support system for efficient management of process industries** ‘ is rated as one of the best quantitative tools for improving the profitability and performance of all industries.

For more details visit the following sites.

<http://business.vsnl.com/ggrtech>

<http://www.r-t-o-l.com/modules.php?name=News&file=article&sid=294&mode=&order=0&thol>

Dr Rajan may be contacted at

ggrajan@vsnl.com