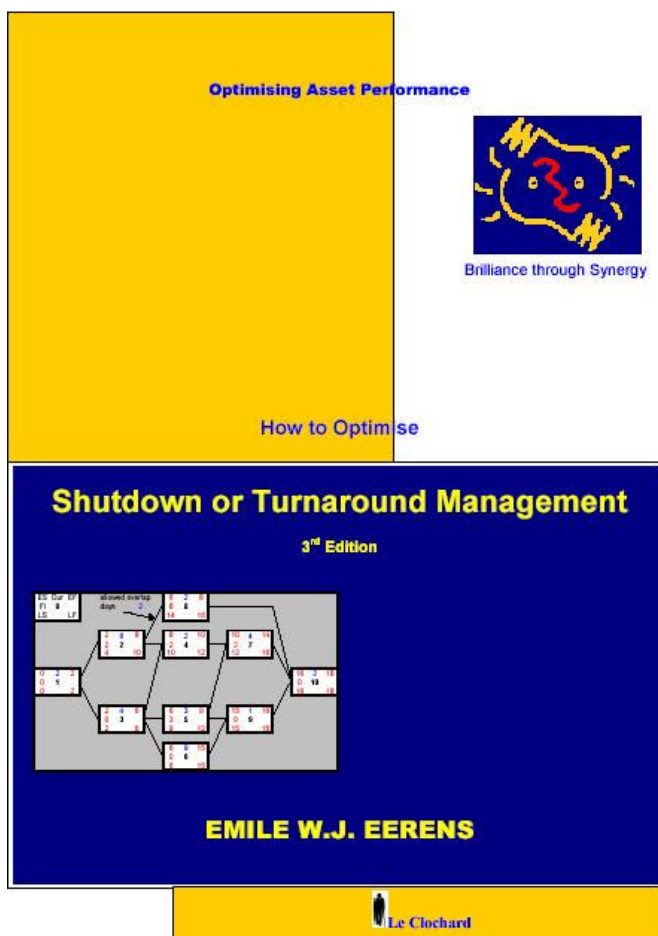




Audience Profile

The book is suitable for everybody seeking to maximize return on shutdown investment. The book analyses the need for a shutdown and the requirements for shutdown management, then systematically guides you through the various phases of a plant shutdown to impart practical knowledge and skills. There is also a chapter on shutdown review or lessons learned system in preparation for the next shutdown. In particular Asset Owners, Asset Managers, Engineers, Planners, Trades Persons, Operators, Finance Managers, Safety Officers and all those who contribute in their roles of first-line (operators and maintainers) and second-line (engineering, designers, logistics, admin, workshops, etc.) asset managers to the output of asset in quantity and quality.

Objectives



To equip those active in the management of productive and infrastructure assets with the knowledge, skills and attitudes needed at the various stages in a plant shutdown to achieve the optimum result in time, quality, resourcing and cost, in support of the business and shutdown objectives.

The course further aims to provide an understanding of:

- transfer of skills in risk analysis and management and developing shutdown schedules with Gantt's and critical path networks
- the need to question 'what we have always done', as this is the only way to actual improvement. For example, an early Chapter in the book discusses whether a shutdown is necessary.

What makes our approach different?

The main difference is developing the shutdown management activities from first principles, questioning everything that 'we always did' and placing Shutdown Management in the context of overall Asset Management. We provide total coverage of everything that is required to assist in successful

shutdown management.

To assist in mastering the material in this manual, we include questions throughout the chapters and team exercises at the end of most chapters. The questions intend to link the material to implementation in the reader's organization. If you have limited experience with the material, it is important to wholeheartedly embrace these questions. The team exercises further intend to 'capture' important members of the readers' work teams in the hope of promoting a wider interest in what the techniques can do for the organisation.



Contents

1. Shutdown Management Explained

Towards most effective shutdown management
What is shutdown management?
What are the objectives and goals of shutdown management?
How does shutdown management link to asset management?
Definitions and acronyms
What are the benefits of improved shutdown management?
Why should you consider improving shutdown management?
What is the shutdown management process?
How should you improve shutdown management?

2. Is a Shutdown Necessary?

Desired learning outcomes
How does asset management drive shutdown management?
What are the business drivers?
What are the business and asset management objectives?
Conflicting business objectives
Why should you develop an asset management plan?
What tools can you use for selecting tasks?
What is Asset Output Optimisation?
What is Reliability Driven Asset Management?
What are the effects of fault types?
Why are shutdowns not the logical outcomes of asset management analyses?
How could you justify shutdowns?
How can you minimize the need for shutdowns?
During asset design, construction and commissioning
During asset operations, maintenance and disposal

What classifies as a shutdown?

Main outcomes of Chapter Two

3. What Do You Need for Managing Shutdowns?

Desired learning outcomes
What is the format of the shutdown process?
What are the shutdown objectives?
How do you manage the shutdown?
How do you plan and schedule a shutdown?
How do you organise a shutdown?
How do you execute the shutdown?
How do you control a shutdown?
How do you terminate and review a shutdown?
What are other aspects of shutdown management?
What is the shutdown initiation and feasibility study?
What affects the quality of the shutdown?
How can you expand the stages with Value Methodology?
Who is part of the shutdown organisation?
Which organisational set-up is most suitable?
What shutdown management style should you adopt?
Who is the process owner or shutdown sponsor?
Who are the stakeholders?
What is the shutdown strategy team?
Who is the shutdown manager?
What are the tasks of the shutdown team?
Do you need role descriptions?
Is team building easy?
What information do you need?
Shutdown objectives
Work scope
Duration
Quality and standard task instructions
Safety
Human resources

Tools and equipment

Materials and parts

Costs

Sources of information

How do you establish a shutdown management communications network?

What is communication?

What are the goals of a communications network?

What are the benefits of meetings?

Which shutdown manuals do you need?

How to report the shutdown?

Which shutdown management reports are necessary?

How to organise access to documentation?

How to distribute documentation?

What shutdown management tools can you use?

CAMS Functionality

Project management software

Main outcomes of Chapter Three

Syndicate Exercise 1

4. How to Perform a Shutdown Feasibility Study?

Desired learning outcomes
Why do you need a feasibility study?
Why should you develop a shutdown business case?
What are the shutdown objectives?
What are the work scope and deliverables?
What is the milestone plan?
How do you establish constraints, risk, opportunities and assumptions?

What are constraints?

What are risks?

What are stakeholder risks?

Why do you need to record assumptions?

What are opportunities?

What are the shutdown success factors?

How important are cost estimates?

Decision making

Main outcomes of Chapter Four

Syndicate exercise 2

5. How to Plan and Schedule the Shutdown?

Desired learning outcomes
What is planning?
How to develop the shutdown plan?
Who should be shutdown planners?
How to select which assets and tasks to include in the final work scope?
How to deal with statutory requirements?
How to manage quality?
What are the outcome acceptance criteria?
How do you manage shutdown risk?
How to ensure shutdown safety?
Assess all work in the one location
What access permit system to use?
How to develop the final work scope?
What is the work breakdown structure?
How do you identify task details?
Recording assumptions
Set estimating guidelines
Estimating time and resources
Can you use timeslots for planning?
Developing pessimistic, most-likely and optimistic scenarios to deal with task uncertainty



Why sign-off on the scope of work and shutdown plan?
What is scheduling?

What is the importance of scheduling?
Why is document control important?
Main outcomes of Chapter Five
Syndicate exercise 3a and 3b

6. How to Schedule with Gantt Charts and Networks?

Desired learning outcomes

What are Gantt charts?

Which basic data do you need?
How to construct the Gantt chart?
What are the benefits of the Gantt chart?
How to use the Gantt chart for monitoring progress?
What are the limitations of Gantt charts?

What are network diagrams?

What are reasons for using network diagrams?
Which information sources can you access?
How to conduct a network development meeting?
What are the network diagram construction rules?

How to develop a critical path diagram?

How to calculate the early start and finish?
How to calculate late start, finish and float?
How to determine the critical path?
What scheduling constraints exist?
Are there other task relationships?
How do critical path and critical task compare?
How to produce a Gantt chart from the network diagram?

Do an interference check

What is the Program Evaluation and Review Technique?
What is the value of PERT diagrams?

How to use the computer for CPM networking?

Linking the shutdown plan to your computerised maintenance management system

Main outcomes of Chapter Six

Syndicate Task 4, 4b and 4c

7. How to Organize the Shutdown?

Desired learning outcomes

How to manage resource limitations?

Are human resources available?
How to schedule for time constraints?
How to schedule for resource constraints?
How to allocate responsibilities?
Allocating responsibilities and authorities

How to estimate materials and supplies?

How to estimate tools, equipment and utilities?

How to estimate support facilities?

How to estimate transport requirements?

How to organise shutdown work orders?

How to estimate and optimise a detailed cost summary?

Cost estimating and work requests
Develop cost-benefit curves

How to tender and contract?

Identify pre-shutdown activities

Pre-shutdown maintenance activities
Pre-shutdown operational activities
Pre-shutdown administration activities
Organising the work site and site access

Main outcomes of Chapter Seven

Syndicate Exercise 5

8. How to Execute the Shutdown?

Desired learning outcomes

What do you need for a shutdown start-up?

How to appoint and develop the shutdown execution crew?

How to develop a successful team?

What is the importance of managing up?

How to claim resources and facilities?

How to ensure resource availability?

How do you claim the necessary space and support facilities?

Training of human resources

When does the shutdown begin?

What is performance monitoring?

How to prepare for monitoring?

What is the importance of progress monitoring meetings?

Can you use inspections to collect information?

How to collect data for monitoring?

What progress can you monitor?

What is the importance of progress reporting?

Controlling shutdown duration, resources and cost

How to use the CPM network diagram to monitor progress?

Network compression

How do you control the shutdown?

How do you solve problems?

How do you manage scope change?

What is the importance of communicating?

Communication with sponsors or clients

Communication with other stakeholders

Main outcomes of Chapter Eight

9. How to Terminate the Shutdown?

Desired learning outcomes

What is shutdown termination?

How to re-commission the plant?

Check operability and maintainability

The commissioning hazard analysis

Are there any final tasks?

Update asset register and database

Verify that all documents describe the plant as re-commissioned

How to finalise administrative details?

Shutdown reporting

Using completed work order information

Human resource performance analysis

Sign-off and hand-over

Closure meeting

What are the benefits of a lessons learned system?

The shutdown report

Restarting the cycle

Main outcomes of Chapter Nine

Bibliography

Syndicate Exercise 4a Solution

Syndicate Exercise 4b Solution

Syndicate Exercise 4c Solution