SPRINGFIELD RESOURCES

maintenance management training and consulting

World Class Maintenance Management Training

Home of

LASER-FOCUSED TRAINING

2020 Catalog

SPRINGFIELD RESOURCES
maintenance management training and consulting

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founded in 1980

World Class Maintenance Management Training

Available in your facility or online, to on your schedule, to your people, customized with the topics you need

Benefits from sponsoring courses in-house:
Our promise for these programs is that your staff will have a new and more in-depth understanding of managing maintenance effectively. With this understanding will come increased ability to control the activity of the training.

In-house courses also have significant advantages over traveling to take the training:

1. Save money if you need to train six people or more
2. Save time since students do not have to lose a day or two in transit to and from the training venue.
3. 100% of the course can pertain to your industry and your maintenance situation.
4. It can be adapted to your maintenance language and forms to be easily understandable.
5. Manuals can incorporate your forms as examples to further enhance the training
6. Individual issues can be discussed on a confidential basis with the instructor.
7. Schedule to be convenient to your business cycle. Unusual schedules can be accommodated, such as night or evening training, ½ day training for two alternating crews
8. Useful as a team-building experience.
9. Help create a shared a common language and vision for maintenance.

Training is also available in 1-hour sessions online to as many as 250 connections at one time: your schedule, no travel, no lost time, ultimate efficiency.

LASER-FOCUSED TRAINING

Testimonial

I would just like to take the opportunity to congratulate you on a very well-run workshop. The content was applicable and understandable. I have already used some of your knowledge to "assist" our maintenance department. The highlight of the presentation for me was the way in which the course was delivered. You certainly know how to get the message across and make the attendees comfortable. Once again my congratulations and thanks. John Russell, Peabody Energy Australia Coal

Listing of seminars available in your facility from Springfield Resources

Title	Page	Short Description
Laser-Focused Training	4	Short online live training for up to 250 connections for any specific topic covered in any other classes.
Prescriptive Maintenance	7	Understand the relationship between Big Data-Analytics-Prescriptive maintenance and good maintenance practice
Maintenance Management	11	Introduction to maintenance management concepts, including metrics, TPM, economic modeling, PM, RCM, planning. Can be customized
PPM (Preventive and Predictive Maintenance	14	PPM is a complete discussion on all aspects of PM. Longer courses add depth and add case studies from your plant.
Maintenance Planning and Scheduling	17	Complete course and hands-on planning workshop. Includes all steps in planning and scheduling work
Maintenance Shut down and turn around planning	20	Complete course and hands-on workshop in planning and managing large maintenance projects and shutdowns.
Maintenance Leadership and Shutdown Leadership	24	Several courses covering topics for leaders including time management, decision making, motivation, communication
Lean Maintenance	26	Lean maintenance is a workshop that introduces cost reduction and carries it out. This is a course for maintenance craftspeople or Lean facilitators.
Maintenance Management for Factories	29	A complete course of managing maintenance in factories, refineries, batch plants.
Facilities Management (Buildings and Facilities)	32	A complete course of managing maintenance buildings, airports, venues, stadiums, office buildings, etc.
The Basics of Fleet Maintenance	34	A complete course to manage truck, car, train maintenance. Does not duplicate Maintenance Management
TPM	37	Introduction to TPM in a factory environment.
Optimizing the Maintenance Inventory	39	Review of all the issues surrounding running an adequate inventory including theory, economics, EOQ, capital spares

All courses include a workbook, and many of the classes have a printed textbook.

Any class or any module in any class can be presented in Laser-focused format. You can pick exactly what you want.

Training can be delivered to small groups to very large groups. Here we are in a beautiful lodge in Hamilton, New Zealand.

Addressing 250 people at the national forum on Maintenance planning and scheduling in Melbourne, AU

Now, at last (technology-enabled!)

Laser-Focused training - short, specific, live, cost-effective training in maintenance, reliability, and asset management

What is it?
Laser-Focused training is short, to the point, and specific online training in all aspects of managing maintenance, reliability, and asset management. It is the right information into the right hands at the right time at the correct cost. Training focuses on your people at their locations and their convenience.

Training Reality:
With changes in technology, strategy, software, and culture, training is an essential element of long-term success. You and your team are too busy to get away for multi-day training. It isn't easy in some plants to take anyone out, even for the essential training. The idea of getting everyone on the same page at the same time about anything is just a dream

Here is how we solve your training problems:
With our new Laser Focused Training, master trainer Joel Levitt provides maintenance, reliability, and asset management modules to your specification. You choose the module; we can provide customization or not (we can include your forms, photographs, video, and examples from your organization). We offer a platform (or we can use yours) for up to 250 computer connections worldwide. Multiple people can participate in each connection.

Your staff logs in, and Joel will be there, teaching his world-class maintenance and reliability training and providing time for specific questions at the end of each module. No need to fly people offsite for training. No need to lose staff for full days away from the job.

- **All classes or modules can be presented in a Laser-focused format. You can pick what you want.**
- Bring the precise training you need to your team in bite-sized (1 hour) chunks
- NO travel costs and no travel time
- No downtime or loss of coverage except while in session. 1-hour at a time
- All training performed live, professionally produced, in 1-hour webinars on the topic you need for 1-250 people (one or more on each connection)
- In short, you can train the whole team, wherever they are in the world at one time (or at several times convenient to the teams' shift assignments and time zones).
- Each session can be recorded
- You can organize sections to cover whole topics (weekly, monthly, or to your schedule)
- Your entire team hears the same message
- Listening to the same message promotes a common vocabulary
- Ask the expert questions (we can extend the training to suit your needs)
- Pay for only and exactly the training you need
- Costs are low compared to conventional training
- Cost per student gets lower as class size increases
- Designed for anyone, anywhere there is an Internet connection

How to order Laser Focused Training

- You will start with a conversation to determine what specific training(s) you need.
- We can customize the session with your forms, language, and in some cases, your approach
- You choose the time(s), and we will run the class.
- We run the program; you get the training and a digital recording
- We can optionally provide certificates of completion

What topics are available?
Any class in this catalog or any module within any class can be presented as a Laser-focused webinar. You can pick what you want and need.

Examples of full programs (with hardback textbooks, workbooks, individual session power points, printed textbooks, homework) Each session is about 1 hour, and there are 3 to 10 sessions per class.

- Introduction to Maintenance Management
- Introduction to Facilities Management
- Introduction to Fleet Maintenance
- Introduction to Maintenance for Manufacturing and Process Industry

- Introduction to Maintenance Planning and Scheduling
- Introduction to Preventive Maintenance
- 10 Minutes a Week to Great Meetings
- 10 Minutes a Week to Great Time Management

- Surviving the Spare Parts Crisis
- Lean Maintenance
- Maintenance Supervision

Some important individual topics (each of these is one session)

Safety and reliability
Maintenance workflow, where does work come from, and job control
Backlog, determine crew size with backlog trend
Prioritization of work
Maintenance photography
Goal setting and projects
Work order, audit, and case study on evaluation of work orders*
Ethics for maintenance management
Maximizing your benefit from CMMS
20 Attributes of World Class Maintenance
Mentoring
Quality and mistakes in maintenance
Problems - We need more issues to be the best we can be.

* Versions for any CMMS and any industry are available and should be customized to your operating environment with your fields, codes, and conventions.

100s of choices of 1-hour training modules for immediate use
We have 100's of Specific topics in all areas of Maintenance Management, Reliability, and Asset Management for a quick presentation.

To give you an idea of some of the modules available:

PM
PM basics
PM report card
Task lists
- Common PM tasks
- Explicit versus implicit tasks
- Types of task lists, where to get the original

Mandatory versus discretionary tasks
A special kind of failure: Hidden failures
PM frequency
Using failure history
PM clocks in use
CMMS approaches to PM and PdM
Thoughts on installing a PM program
- Reporting deterioration
- Tying CM to the PM ticket

TLC (Tighten, Lubricate, Clean)
Tasklist development, class of equipment, process
- Hidden protective devices
- Tasklist: Full analysis (all aspects)
- Conduct a workshop for existing task lists
- Case study test of simple task lists – *improve?*
- Review of real task lists
- Questions to ask and examples

P-F Curve
Reliability enhancement programs
- RCM
- PMO
- TPM

Consequences: P/PM economics
- Past Sins- unfunded maintenance liabilities
- Costs of PM system (your company)
- Breakdown costs and consequences
- Alternatives with cost justifications
- *How to sell PM to management*

Predictive Maintenance Technologies
- Detective Maintenance
- Questions before you start
- Chemical and particle analysis
- Vibration
- Temperature
- Visual techniques

Management of PM activity
- Planning and scheduling PM activity
- Access to equipment
- Interruptive, non-interruptive maintenance
- Metrics
- CMMS approaches to PM and PdM

Installing or upgrading CMMS
Short Repairs and high productivity
PM People issues
- Staffing the PM Effort
- Personality to look for in a PM inspector
- Ensure that PMs are done as designed

Maintenance Planning and Scheduling
- Glossary of terms
- Reality of Maintenance
- Breakdowns, iceberg
- Justify planner
- Preparation for planning

Maintenance Planning
- Setting up planning/scheduling
- Steps ongoing planning/scheduling environment
- Planner: Roles, responsibilities, qualifications
- Planner's checklist, planning provides Emergency planning
- Hints from the trenches
- What is a planned job package?
- Estimating techniques, using estimates
- JSA and safety in planning
- Planning -construction estimates
- Detailed planning questionnaire and gap analysis

Scheduling (how is it different from planning)
- Maintenance calendar
- Ready backlog, validate backlog
- Develop a work program
- Coordination and agenda for a weekly coordination meeting
- Scheduling
- Jobs of the scheduler

How Planning and scheduling improves productivity
- The way productivity increases
- Ideas – sorting jobs, scheduling together, what is the key to having a schedule?
- Scheduling uncovers problems in your operation
- Detailed scheduling and coordination
- Questionnaire, gap analysis

Metrics
- Schedule compliance,
- Direct and indirect measures of planning effectiveness

Maintenance Supervision
- Introduction, goals, roles
- Motivation, successful motivation techniques
- Self-assessment
- Role models
- Decision making, delegation, One Minute Manager
- The complete PM cycle
- Dealing with difficult people/situations
- Transition, orientation, discipline,
- Special supervision issues

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Prescriptive Maintenance class

Who: This program is for all types of maintenance environments. Attendees should include Directors responsible for Maintenance and Asset Management, executives responsible for big data/analytics corporate-wide, plant managers, maintenance managers, CMMS managers, engineers, include IT professionals responsible for IIoT and Analytics for Maintenance and people who are in training for these positions. There is also an advantage to having representatives from operations, production control, and stockroom for their perspective and input.

Learning Objectives

- How to use technology to the best advantage
- Understand the relationship between Big Data-Analytics-Prescriptive maintenance
- What to do first
- Develop algorithms for maintenance data analysis
- See and understand Big Data
- Where AI fits into to maintenance
- Understand the real meaning of all the words of the field
- Plan for integration into your current maintenance effort
- How to build a business case for prescriptive maintenance
- Know what outside of the technology is missing for exceptional reliability to become present

Why attend:
There is a sea change in the way people need to think about maintenance. The Industrial Internet of Things drives this change. With the newly minted horsepower and capacity, we can finally handle big data and yet apply machine learning and artificial intelligence to maintenance and repair.

Each of these technologies would, by itself, transform maintenance. There are now unheard-of opportunities. There are hucksters peddling buggy software and hardware not up to your needs in times of significant change. Millions will be wasted through a fundamental lack of understanding of the state of the business.

It is no longer adequate to be good at maintenance since the whole enterprise's fate rests on smooth, downtime free capacity. There are hundreds of new techniques, gadgets, software, and models to approach low cost, reliable capacity.

Some of the things you will learn are (partial list):

- What is prescriptive maintenance?
- How does it work?
- Why big data, analytics, machine learning is essential but NOT SUFFICIENT for world-class maintenance.
- Will we have to change to use this stuff?
- How can we apply this to our unique situation?
- What is an algorithm, and why should I care?
- How does it fit into our current practices?
- What is our maintenance maturity, and how will it impact implementation?
- What are the parts of prescriptive maintenance?
- What can it do?
- What are some of the vendors' offerings?
- Can I get rid of the existing PM?
- What is analytics for the non-computer professional
- How much would I spend on each level of prescriptive maintenance?
- How does the computer figure out what has to be done?
- What are the pitfalls?
- What exactly is big data, why is it important?
- Is machine learning here, or is it still years away?
- What is a digital twin?
- What are some of the false promises of big data?
- Where did all this new tech come from?

Exercises and Case Studies: Different people are different types of learners. This seminar features many other training modalities. This course has several kinds of exercises, discussions, activities, and case studies to enhance the training experience and teach specific knowledge of prescriptive maintenance.

What this is not

This class is not a class in implementing artificial intelligence or the advantages and disadvantages of various algorithms or analytic approaches. In short, this is a course for maintenance-oriented professionals looking for knowledge and insight into this new field. It will also show IT professionals the maintenance application's shape and topology with some of the necessary interfaces.

Prescriptive Maintenance Course Agenda

- Introductions
- Goal: Best business decision possible for the whole company.
    - Easier for computers than for humans
    - Why do this (it goes beyond just improving maintenance)

- Defined: What is Prescriptive Maintenance?
    - What does prescriptive maintenance mean
    - One of the first examples of prescriptive maintenance (human-driven)
    - Hierarchy
    - Basic block diagram

- This is a bigger conversation than just IIoT or big data

- Goal of Maintenance
- The purpose of maintenance is enhancing your reliability maturity
- Maturity: Reactive, Preventive, Predictive
- Now we've added the Precision domain
- We've added Prescriptive Predictive
- Aspirational domain -World Class
- Exercise- where are you?

- CMMS
  - Work orders
  - How to improve the quality of your work orders (Exercise)
  - How to audit work orders
  - Importance of configuration and hierarchy
  - Using work order data for RCA (human analytics) exercise

- Where does Prescriptive Maintenance fit into a traditional maintenance model
  - Uptime Elements model
  - Where does maintenance work come from
  - Workflow
  - Backlog
  - IIoT sensors monitored by computers case study
  - Source and timing of work is pivotal

- Guess what; you still need PM!
  - Problems with PM
  - Gain productivity with Short repairs
  - Fundamentals- TLC
  - How to measure existing efforts

- PM and PdM defined for this class
  - Tricks of the trade
  - Iatrogenic failure
  - Types of task lists
  - Where do the task lists come from, frequency?
  - High tech Inspection
    - Chemical analysis
    - Vibration analysis
    - Infrared
    - Ultrasound
    - Visual

- History- Where did it come from? The AI movement
  - AI
  - Machine learning

- Economic justification. What are the costs? Where is the Return on Investment?
  - Sins of the past

    - Breakdown costs exercise
    - A short course in economic modeling (Exercise)
    - How much will IIOT, prescriptive maintenance cost?
    - Listen to your management to sell them

- How widespread is the adoption of the elements of Prescriptive Maintenance?
- Antecedents: What must be in place to take advantage of the present systems?

- Big data
    - There is a certain amount of fluff you must breakthrough
    - Breakdown of sources of data with detailed example
    - PM inspection
    - Predictive Maintenance
    - Asset halo
    - Digital twin
- Analytics
    - Descriptive
    - Diagnostic
    - Predictive
    - Prescriptive
    - Examples of analytics
    - Exercises in analytics

- Prescriptive maintenance is algorithm based
    - Quick Class in algorithms
    - Algorithm for HVAC exercise
    - Algorithm rules for oil change exercise

- Pitfalls and shortcomings of Prescriptive Maintenance

- Create a roadmap to Prescriptive Maintenance

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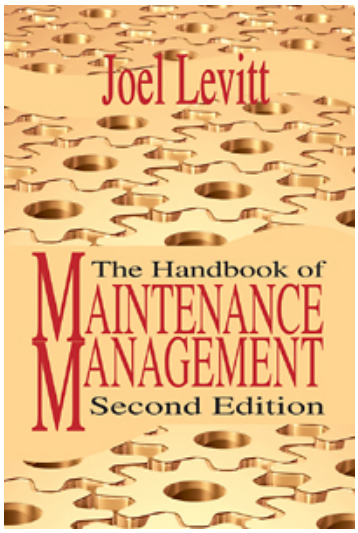

NEW Comprehensive Maintenance Management Seminar

Three and 4-Day

Based on popular text, updated with cutting edge tech like prescriptive maintenance, IIoT sensors, AI, Drones, Virtual Reality and more.

You will leave the New Comprehensive Maintenance Management Seminar with a plan you will develop for the future.

This program is for:
For all types of maintenance environments, including factories, buildings, and fleets. Maintenance managers, supervisors, leads, CMMS managers, planners, engineers, and people in training for these positions. There is also an advantage to having representatives from operations and stockroom for their perspective and input.

Maintenance Managers
Engineering Managers
Maintenance Planners
Maintenance Schedulers
Maintenance Supervisors
Maintenance Coordinators
Other departments that work with maintenance
Plant Directors / Managers / Engineers
Maintenance Engineers
Safety Manager / Engineers Production
Managers / Engineer
CMMS Managers / Engineers / Planners
Operations Managers / Engineer
Facility Managers / Engineer

Our promise for this program is that you will have a new and more in-depth understanding of reliability and maintenance and a deeper understanding of how to manage a modern maintenance function

With this understanding will be the dramatically increased ability to design, plan for, and manage these activities.

We are living through a unique time. The old guard is retiring, and the tech-savvy new guard needs some background in maintenance management to maximize their effectiveness

The program includes a 170+-page workbook. Class is available in 3 and 4-day lengths.

Some of what you will learn

- Speed-up and improve training with Virtual Reality
- How to talk to top management about caring for your assets.
- Ways to cut the cost of your repairs by teaching five planning techniques to your tradespeople
- In-sourcing and TPM: what is it, how and when to do it, and who to do it with
- How to use the CMMS to help improve technicians
- Maintenance budgeting and effective financial modeling
- How to compute the optimum intervals for component replacements and other preventive/predictive maintenance efforts

Need some training to get your team up to date? Do you have retirements and are losing skills? Want to brush up your skills? Do you have newer people and want them productive? Want everyone to share a vocabulary? Want to promote cooperation with other groups (purchasing, stores, engineering)?

Maintenance Management class in Port of Spain -Trinidad and Tobago

This jam-packed course will introduce you to best practices from around the world. You'll be able to answer:

- What specific activities ensure uptime and when to consider each one?
- How to use high technology to make an impact on your reliability
- Learn techniques to maximize benefits from your CMMS—Tomorrow!
- How to eliminate defects, improve quality and remove workload
- How to put together a business case proposal using the same financial modeling as top management
- How to set-up a pilot in IIoT sensors and analytics of the data produced (without breaking the bank)
- How to build a technology road map and timeline.
- Ways to re-engineer maintenance that do not compromise the safety, environmental security, or uptime

Pre-Session 1-hour Online webinar
This introductory webinar will introduce the concepts and language of the entire class. It also will distribute questions that the students can get answers that will improve their understanding of the current state of maintenance. Typically conducted approximately two weeks before the class at a convenient local time.

Course Agenda

In the following agenda:
RED – Exercise with class involvement and discussion
BLUE—Case Study from Relevant industry

All sections will include discussions, case studies, exercises and will consist of activity to help plan your future direction

Day 1

Managing assets at the corporate level

- Uptime elements
- An investigation into what is reliability, what is maintenance
- Asset Management and ISO 55000
- Consistent decision making
- 4 ½ dimensions of maintenance
- Time, life cycle management, and real cost reduction
- What is the value provided by reliability/maintenance?
- Goal: Better business decisions

The engineering of failures

- Failure, breakdowns, and managing risk
- Calculating the consequences of a breakdown
- How things fail (engineering of failure)
- Reducing Iatrogenic failure

What is your culture of reliability?

- Companies' mission, vision, and values
- How culture eats strategy for lunch!
- Integrity
- Safety as a cultural conversation
- Overriding Mission or Vision of organization and their impact on maintenance
- Understanding Patterns-3 case studies in patterns in maintenance.
- Describe your situation- Exercise in determining your pattern by talking through the different elements of your current operation.

Class in Ghana

World -Class Maintenance

- Maturity of effort
- Precision maintenance
- Aspirational domain
- The real goal is to contribute to your organization's mission
- Maturity of your effort
- Precision Maintenance and Alignment and balancing
- Maintenance Improvement

Tools of World Class Maintenance

- Reliability Centered Design
- RAMS
- Reliability Engineering
- Defect Elimination: Case studies: Save company millions. Here are some examples
- **Exercise: Learn to conduct Defect Elimination effort**

Reliability Strategy Development

- Criticality Analysis exercise
- FMEA
- RCM
- Case Study in RCM

Day 2

- PMO

PM

- PM Report Card
- PM, PdM defined
- TLC (TPM)
- Exercise how and where to use TLC (Tighten, Lubricate, and Clean) to minimize breakdowns (75% of failures are from defects in these areas)
- Contents of the Visual Workplace
- 5S

P/F Curve

- Understand the PF curve
- Understand the DIPF curve as an opening for action

Asset Condition: Real-time condition data collection

- Deep dive into the Predictive sciences
- IIoT (Industrial Internet of Things) sensors- Examples and use cases
- PdM Checklist
- PdM summary of technologies, PdM summary
  - Visual examples and use cases
  - Drone inspections Use of drones
  - Lubrication and analysis Use cases
  - Vibration

  - Infrared Examples and use cases
  - Ultrasonic
  - Motor testing, NDT
  -
- Case studies in Predictive Maintenance. Scans, reports from live users of different technologies

Day 3

CMMS: Integrating new tech into traditional computerization

- Asset Knowledge
- 5 Keys to CMMS
- Parts of CMMS
- CMMS: Importance of configuration and hierarchy
- Concise assessment of current CMMS
- How can I maximize my use of CMMS?

Work Execution Management

- Workflow and fitting hi-tech maintenance fit into a traditional maintenance model?
- Job Control (how to set it up to improve outcomes for customer and reduce effort)

- Backlog defined and how to use it to manage the shop
- Prioritization
- Work Request
- Reduce workload with 15 questions
- Work order, auditing, and training
- Work order audit and subsequent training

Effective supervision

- Active supervision
- Quality in Maintenance
- **Quality Improvement: an exercise in how to improve quality**
- Nature of mistakes and how to mitigate them
- Craft training
- Industrial Augmented Reality
- Virtual Reality for training

Economics and support of maintenance

- Economic Modeling- Economic and business justification Exercise: How to analyze maintenance alternatives using economics modeling.
- Budgeting
- Justify Contracting
- Specifics to improve the Purchasing relationship
- Storeroom services and current conditions
- How to evaluate your storeroom
- Know your A, B, and Cs
- Exercise to reduce costs and quantities of spares

Day 4

Planning and scheduling the workload

- Planning a maintenance job
- Planning and scheduling
- Ready backlog, a work program for next week
- Coordination with operations and developing the worklist
- Preparing the weekly schedule for next week
- Managing shutdowns and outages
- Scope of work
- Work validation
- Safety, execution, maintaining quality
- Lessons learned

Up to date, computerized approaches to reliability

- Block diagram of hi-tech for maintenance
- Hi-tech Maintenance is a small part of a bigger conversation
- Big data and example
- Asset halo and digital twin
- Types of Analytics
- Examples of analytics
- Exercises in analytics
- Exercises in Algorithms
- AI, machine learning

Day 4 Wrap-up: Develop a project to forward the action for transformation

Instructor, author, Joel Levitt receiving award for keynote speech at SABIC safety award day

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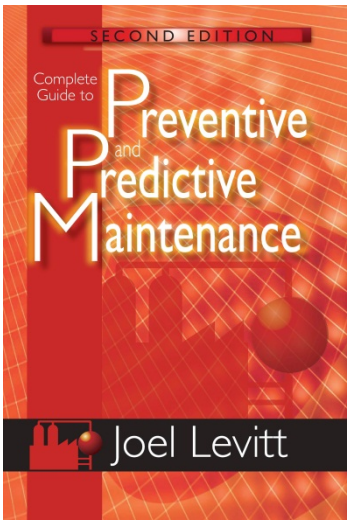
PPM (Preventive and Predictive Maintenance)

Who: This program is for all types of maintenance environments. Attendees could include maintenance managers, maintenance engineers, RCM and PM specialists, PdM leaders, supervisors, lead hands, CMMS managers, and people in training for these positions. There is also an advantage to having representatives from operations, production control, and stockroom for their perspective and input.



What: 1, 2, 3 or 5-day class includes a spiral-bound workbook and the text *The Complete Guide to Preventive and Predictive Maintenance* Second edition by Joel Levitt

Why: PM has always been the best method of preserving assets. Whether you maintain process plants, factories, buildings, or a fleet, the PM system can be the core of the proactive effort.

There is much to know to design useful PMs for different types of equipment. In a short time, this course will bring an entire department to a deeper understanding of how to make PM and PdM more effective. This course offers a foundation for any organization wanting to improve or set-up a PM system.

Some of the specific things you will learn:

- ✓ How to reduce waste in PM activity
- ✓ What changes to make to improve reliability
- ✓ What changes to promote repeatability
- ✓ How to gain productivity through a small change in thinking
- ✓ How to plan and schedule PM
- ✓ Developing task lists for different equipment
- ✓ How to evaluate existing task lists
- ✓ How things fail and their impact on PM
- ✓ Who makes the best PM Person?
- ✓ How can we adopt Planned Component Replacement?
- ✓ What are the basics of predictive maintenance?
- ✓ How can we use the P-F curve to choose inspection frequencies

Exercises and Case Studies: Different people are different types of learners. This seminar features many other training modalities. This course has several kinds of activities and case studies to help enhance the training experience and teach specific PM and PdM skills**.**

Agenda for the 2-day version of Preventive and Predictive Maintenance

Day 1

Blue case studies, Red exercises

1. Specifically, how safety and reliability are interrelated.
   - How PM avoids accidents
2. Groundwork
   - The goal of maintenance
   - PM, PdM Defined
   - PM Report Card and 10 Questions exercise introduction to the issues
   - How much is enough?
   - Iatrogenic failure an essential mechanism to understand PM
   - PM as a percentage of hours a diagnostic exercise
3. PM Basics
   - Task lists
   - Common PM Tasks
   - Other aspects of the PM system or program
   - Mandatory versus Discretionary
   - A special kind of failure: Hidden Failures
   - How things fail, and the type of PM needed for each failure style
4. PM Details for effectiveness
   - Different types of task lists
   - Where to get the original Task List
   - PM frequency
   - PM clocks in use
5. Task List development
   - How to develop task lists, what to avoid
6. Tasklist analysis –analysis to avoid wasting money and precious time
7. Advanced Concepts- P-F Curve
8. Reliability Enhancement Programs
   - RCM
   - PMO

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Day 2 Preventive and Predictive Maintenance

Items in blue are case studies, and red are exercises

1. Review of Day 1 and questions
2. Analysis of a task list of a machine (major Exercise). The result is a substantially improved task list for your use
3. TLC (Tighten, Lubricate, Clean)
   - How to make all task lists more repeatable
4. P/PM Economics
   - Consequences
   - Past Sins
   - Breakdown costs (this is what we are avoiding) determine costs
   - Basic Economic modeling: Alternatives with Cost justifications
5. Selling PPM to management: Battle for a share of the mind
   - What to say when selling PM to management (identify priorities)
6. Predictive Maintenance
   - Questions before you start
   - Chemical and particle Analysis Predictive tasks
   - Vibration
   - Temperature
   - Visual techniques
7. Control of PM activity
   - Planning and Scheduling PM activity
   - Access to Equipment
   - Interruptive maintenance and non-interruptive maintenance
   - Metrics
   - Outsourcing PM
   - CMMS approaches to PM and PdM
   - Short Repairs and high productivity develop a strategy for your facility
8. People issues
   - Staffing the PM Effort
   - What kind of personality to look for in a PM inspector
   - How to ensure that PMs are done as designed
9. Create an action plan to cut costs, cut waste and improve reliability

This class is available in 1, 2, 3, and 5-day versions
This course can be given as a practical workshop on your shop floor.

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Maintenance Planning and Scheduling

Who: For intensive (and generally more extensive) maintenance environments including utilities, large factories, refineries, smelters, chemical and process plants, extensive facilities, etc. People who would benefit include maintenance planners, supervisors, schedulers, material coordinators, and people who must manage the planning function. Senior maintenance workers that get involved in creating job plans would benefit also.

Also, anyone tasked with starting up planning and scheduling, including managers, maintenance engineers. There is also an advantage to having representatives from operations and stores for their perspective and input.

What: 1, 2, or 3-day class includes a spiral-bound workbook and the text *Managing Maintenance Planning, Coordination and Scheduling* Second edition by Don Nyman and Joel Levitt

Why:
Well-planned, adequately scheduled, and effectively coordinated jobs can be accomplished

- more efficiently
- at lower cost
- with fewer disturbances to operations
- with higher quality (reduce variability in your process),
- greater safety
- improved morale (by providing greater job satisfaction),
- increased longevity of equipment.

A few extras like reduce parts usage and higher organizational morale (in production departments) are also direct benefits. Effective planning and scheduling also help increase the professionalism of the maintenance effort. In short, more work is completed more promptly, thereby increasing customer service. It's simple; you reduce wasted resources and save money.

Exercises and Case Studies: Different people are different types of learners. This seminar features many other training modalities. This course has several kinds of activities and case studies to help enhance the training experience and to teach specific skills of maintenance planning and scheduling

Agenda for the 2-day version of Maintenance Planning and Scheduling

Day 1

Blue case studies, Red exercises

- The Truth about Productivity
- What is maintenance planning?
  - Why is planning essential for smooth operations?
  - What are the advantages of planning?
  - How to Sell Planning & Scheduling to your management and operations?
  - Specifically, where is the ROI (Return on Investment)?
- Where does Planning fit Into Good Maintenance Practices?
  - Understanding the Nature of Maintenance Activities.
- Work order systems
  - Auditing work orders and
  - Training in completing work orders.
  - A short discussion of the workflow with a job control function.
- A complete description of the planner's job.
- What are the conditions necessary for effective planning? This section includes a discussion of the institutional systems required for successful planning and scheduling. Specific areas include storerooms, PM programs, planner Libraries, supervision, and high-level sign-off.
- How to plan maintenance work
  - What are the steps in effective planning?
  - The complete planning process.
  - Estimating, Crew Size & Manpower Requirements.
  - What are the contents of a complete planned job package?
  - Plan a job exercise
- Complete Planning questionnaire so that participants can evaluate their current planning operation against competent and world-class organizations.
- Evaluate the gap between what is going on and what would serve the long-term interests of the organization.

Maintenance Planning and Scheduling class held for Jordan Aviation in Amman, Jordan

Day 2 Course Agenda Maintenance Planning and Scheduling

- How and why to prepare the Maintenance Calendar
- Calculating available hours from maintenance workers. Includes worksheets.
- The coordination meeting between operations and maintenance
    - Discussions and deliverable from meeting
    - Agenda example
    - Job loading until available hours is used up.
- Scheduling
    - Calculating available hours for maintenance workers.
    - Coordination with Operations Coordination meeting.
    - Choose jobs based on need and available resources
    - Create a credible schedule that takes all the constraints into account.
    - Schedule a shop exercise

- How to use CMMS to Aid Planning and Scheduling.
- Job execution and feedback with job closeout and follow up
- Metrics and Benchmarking Planning and Scheduling
- Complete scheduling and coordination questionnaires so that participants can evaluate their current planning operation against competent and world-class organizations.

This class is available in 1, 2, and 3-day versions

Maintenance Planning and Scheduling in Port of Spain, Trinidad

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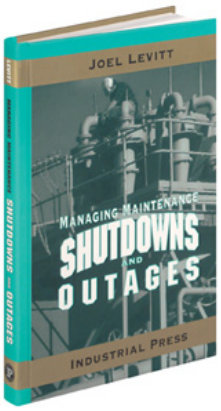
Managing Shutdowns, Turnarounds, and Outages

Who: This course is for heavy maintenance environments, including refineries, power plants, chemical plants, mines, large factories, and other extensive facilities. It was designed specifically for project managers, outage planners, planners, maintenance managers, project engineers, supervisors, maintenance engineers, and people who are in training for these positions. This course is also designed for contractors who manage entire or parts of client shutdowns.



Prior background in Project Management would be useful but not essential. The best use of this course would be for an organization planning a shutdown or outage shortly.

What: The 3-day course includes a spiral-bound workbook and the text *Managing Maintenance Shutdowns and Outages*

Why: The Master Check List series of exercises (one list for each phase) is unique for this course. Each student will receive and review a master checklist developed over the last 20 years of items that have caused past shutdowns problems. The lists are updated as new people take the course and contribute to their experiences.

The Report card is used to evaluate your shutdown program and see where there is room for improvement.

In the Exercise on meetings, the student can look at the meeting rules they follow and pick some areas where extra attention would enhance the shutdown effort

Preparing a Typical Timeline exercise is designed to show the student the benefit of managing the shutdown intensively from conception to closeout

Estimating Exercise takes a typical shutdown job and shows the students how to micro-plan a job.

Do you have enough time to plan and schedule the shutdown properly? The Planning lead times Exercise will show that and show how many people will be needed if you don't

The Critical Path Method (CPM) Exercise tests the student's new knowledge of shutdown activity scheduling. It starts with a worklist and has the students develop a CPM network diagram highlighting the critical path and the shutdown duration.

A few things you will learn:

- ✓ Giant- checklists of everything to consider before the shutdown and when to consider it.
- ✓ How to prepare your customized checklist so everything is remembered.
- ✓ When to say **no** to added work
- ✓ Know when and how to use Gantt, CPM, and PERT charts

- ✓ What documents to save and how to organize them
- ✓ Know how to break a job into activities
- ✓ How to set up the shutdown team
- ✓ How to account for everything that goes into an outage or shutdown
- ✓ Where to look for help on estimates
- ✓ Find out what shifts structures to use and how much they cost.
- ✓ Checklist of specific safety risks to protect your workers
- ✓ How to control a shutdown
- ✓ How to pick project management software
- ✓ How to ensure lessons learned are not forgotten
- ✓ What to do if a shutdown has gotten into trouble
- ✓ How to calculate the critical path even if you don't have software.
- ✓ How to know which work orders you should work on first.
- ✓ How to evaluate the effectiveness of your current shutdown effort.
- ✓ Where to find some great Internet-based resources.
- ✓ Be able to budget your next shutdown, turnaround or outage effectively
- ✓ Know how to manage risk on any project
- ✓ How to learn from your mistakes and institutionalize lessons learned
- ✓ How to get the most from your existing Project Management software
- ✓ Where to find free and low-cost software for shutdowns.
- ✓ How to set-up a safety program for your shutdowns
- ✓ How to do a JSA for individual jobs

Agenda for 3-day Managing Shutdowns, Turnarounds, and Outages - Day 1 Planning the Shutdown

1. Mastering the Basics of Shutdowns, Turnarounds, and Outages
   - Language definitions
   - Size of events matter
   - Essential Skill –Meetings Exercise and discussion to make your meetings more effective
   - KPIs for a shutdown
   - Comparing project management versus typical shutdown
   - Defining Constraints
   - Cover-up
   - Communications and presentations
2. Group activity: Quick report card- **Exercise to analyze your shutdown from various aspects and discuss it with a partner.**
3. Putting the whole Shutdown into time -Phases of a shutdown
   - Scheduled Audits
   - Preparing a Typical Timeline -**Exercise**
   - Instituting a long-term shutdown policy
4. Shutdown Organization
   - Ensuring great communications
   - Shutdown team titles
   - Roles and responsibilities
   - Accountability tip
5. Master Checklist for Phase 1 Initiation Exercise

Begin training about Phase 2 (planning and scheduling) of the shutdown

Scope of work -Inputs into the Shutdown

- Examining the Sources of work
- List of sources to check before closing the worklist
- Checklists for Infrared and Vibration inspection before the shutdown

- Work Validation (get rid of duplication, subsets, and other non-essential work)
- Packaging of work for bidding
- Prioritization of work

6. Shutdown Planning- Individual job planning
    - Planning Thought Process
    - Essential elements of job planning
    - Special requirements of Large jobs
    - Planned Job package
7. Planning lead times **Exercise**
8. Planning and Estimating **Exercise**
9. Risk, safety, and health
    - Threat matrix
    - How to run a Safer shutdown
    - Safe work process
    - Safety risk list
    - How to do JSA for planning (Exercise)
    - Managing other risks

Day 2 Managing Shutdowns, Turnarounds, and Outages
Scheduling the Shutdown

1. Scheduling (Project Management Techniques)
    - History of Project Management
    - Software available
2. Critical Path Method (CPM)
    - Essential concepts for all PM techniques
    - Project management techniques
    - Gannt Charts, CPM charts
        - Display and Milestones
        - Dependencies
        - Float
        - Crashing
        - Exercise in Planning and scheduling an acid line shutdown
3. Resources
4. Logistics
    - Site plan
    - Managing the logistics' challenges in a shutdown
    - Effectively managing your personnel and material resources
    - Site set down plans
    - Questions to be able to answer
    - **Strategic sourcing for parts, materials, and supplies**
5. Contracting and Contract management
    - Legal framework
    - Tools of contracting: types, uses, essential concepts
    - Legal Relationships
    - Avoiding problems
    - Example of a legal case study in shutdowns

Day 3 Managing Shutdowns, Turnarounds, and Outages Executing, reporting on, and Accounting for the Shutdown

1. Master Checklist for Phase 2 Planning, Scheduling Exercise

Begin training about Phase 3 (planning and scheduling) of the shutdown

2. Quality
    - The core of attaining quality (and safety too!)
    - Ensure quality
    - Hold points
    - Shift schedules
3. Managing Execution
    - Shutdown the plant and Start-up the plant
    - Daily schedule and feedback
    - Shutdown review meeting agenda
    - Project leader failure techniques Exercise
    - Daily routine
4. Phase 3 Execution Master Checklist Exercise

Begin training about Phases 4, 5 of the shutdown

5. Shutdown essentials
    - Accounting, costs, and budgets
    - Completion
    - Reporting
    - Lessons learned
    - Files to keep and review
6. Phase 4 Completion of work Master Checklist Exercise
7. Phase 5 Completion of project Master Checklist Exercise
8. Wrap-Up Session
    - The final session examines the topics that were covered over the last two days,
    - Questions and discussion
    - Each student chooses an area to work in for their next shutdown event

This class is available in 1, 2, 3, and 5-day versions

Shutdown and Outage class held in Mumbai, India

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Management Skills for Maintenance Supervisors, Team Leaders and Managers level 1

Who: This course is for people who supervise or manage maintenance work. Its focus is on the necessary management and people skills needed to foster maximum productivity, high quality, and good morale. Ideal candidates either supervise maintenance workers or manage maintenance through supervisors.

This course is also recommended for people being considered for advancement. A third group would be Supervisors from other departments that work with maintenance because they could learn about supervision and essential maintenance management.

What: This course series is available in level 1 and level 2. Each level can be 2 or 3 days. There is also a related class for the Shutdown Leadership team, which is 2 or 3 days. All versions have spiral-bound workbooks.

Why: Many topics are covered to aid the supervisor in their effectiveness: How to increase the amount of work you get done through introductory time management techniques. Learn to deal with difficult people effectively. Learn the basics of planning and scheduling. How to know the strengths and weaknesses of your workgroup. Setting up a work schedule that adds to the productive day reduces confusion and helps get your users rooting for you. How to supervise friends and older employees successfully and sensitively. Identify the great PM inspector within your crew. How to take seminars and retain more information. Specific techniques to help you react well and make the right decisions in high-stress situations. Also, some of the things you will learn:

- Proven methods for handling problems with difficult employees, vendors, and coworkers
- Specific ways to make the change from technician to supervisor quickly and effectively
- How to communicate with management to get them to implement your suggestions
- Easy-to-implement techniques to improve your workers' productivity
- How to use preventative maintenance to better control breakdowns
- Guidelines for assessing your existing PM system to identify areas that can be improved
- How you should prioritize your PM task list and what tasks you can eliminate
- How to deal with the unique challenges of supervising friends and older employees successfully and sensitively
- How to recognize the signs that an employee is about to quit
- Tried and proper guidelines for hiring and retaining the best employees
- Up-to-date information on low-cost, high-technology predictive maintenance techniques
- How to optimize your particular strengths and minimize your weaknesses
- Proven methods to teach you how to control your reactions in high-stress situations and to help you make the best decisions at those critical moments
- The three basic rules of managing employees so that you motivate your workforce to perform at the highest level possible
- The best way to present what you have learned at this seminar so that management will see it (and you) in a positive light
- What every supervisor should know about computerized maintenance management

2-day Management Skills for Maintenance Supervisors, Team Leaders and Managers Level 1

Agenda Day 1

Red are interactive exercises of various types

1. Attributes of a great maintenance supervisor: Effectiveness as a supervisor requires balancing a good many capabilities. Techniques are introduced to improve learning for all seminars.
2. Exercise in motivating maintenance workers. Determine what motivates maintenance workers.
3. Maintenance Planning and scheduling: The course features a rapid, complete overview of maintenance planning and scheduling — maintenance job planning exercise.
4. Supervisor evaluation clinic: Every supervisor brings something unique to the supervisory relationship. The participants will be shown how they are as supervisors, where they need development, and where they have weaknesses that can be exploited by their subordinates, peers, or bosses. Exercise to determine your supervisory style.
5. Coping with difficult people: Successful dealing with difficult people and situations is a crucial skill for supervisors to deal with a difficult situation or person.

Day 2

1. The complete PM (Preventive Maintenance) cycle: The Complete PM Cycle introduces using a PM model of organizing all maintenance. A checklist is included to install a new PM system or revise existing one.
2. Computerization of Maintenance for supervisors. How to understand the CMMS and make it work for you.
3. Condition-based Maintenance: This chapter discusses each primary inspection mode (vibration, infrared, ultrasonic, etc.) and gives guidelines for getting involved. Presentation and discussions about PdM experiences
4. Particular Problems of the maintenance supervisor: Maintenance supervisors face challenging problems. Issues include dealing with discipline, supervising older and younger employees, supervising friends, drug and alcohol abuse. Exercise and presentations in local special issues
5. Supervisor Productivity Enhancement: Introduction to time management. The text provides a reading list and a resource list for further study. The course ends with the writing and committing to an Action Plan. Exercises in time management and setting priorities

Testimonials

- "Outstanding! Very easy to understand. Gets the point across nicely." – R. Scott, SCM Chemicals
- "Innovative ideas, good examples." – D. Morrison, Seagate Technology
- "Wish I had this 10 years ago when I first became a supervisor." – J. Hart, Dir of Prop Ops, Hilton Hotels

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Lean Maintenance

Who: This course is for all levels of maintenance personnel, particularly maintenance workers. Supervisors, planners, managers, and maintenance engineers can also take it. The course works best when people from different levels, jobs, or other plants take it together. A diversity of opinions and experiences is desired.

What: Available in 1, 2, and 3-day versions. Course materials include a spiral-bound workbook and the text *Lean Maintenance* by Joel Levitt

Why: This course teaches specific techniques for locating and attacking waste and reducing the costs of operation. The outcome of the session is a series of Lean projects ready for execution. The projects will be designed, prioritized, and justified.

- Save money immediately
- Save resources
- Increase uptime

Some of the specific benefits of this Lean Maintenance course include:

- How to uncover real waste in your operation
- How to solve problems and make the solutions stick
- Know which project is the winner among all the waste uncovered.
- Find the low hanging fruit (just waiting for you to pick it!)
- How to design a project from the beginning to the end
- How to present your ideas to management
- Execute the project and get credit
- Prove the Returns on Investment
- Change the perception of maintenance

One day Lean class during PEMAC meeting in Toronto

Agenda for the 2-day Lean Maintenance course:

Day 1

1. Lean maintenance and where it fits in, problem-solving
2. History of Lean Maintenance
3. Techniques for continuous improvement, including inputs to maintenance.
    - Looking at the inputs to maintenance for areas to make more efficient
    - Looking at the outputs to optimize the use of the resource
4. How Is Lean Maintenance related to Lean Manufacturing?
    - Lean maintenance provides a Lean service to operations
5. Many of the tools can be brought over (types of observation, eight losses, etc.)
    - How to see waste in your process
    - The role of Lean Maintenance
6. Be Lean, to survive global competition
    - Be Lean to be a preferred employer
    - Have faster reaction times to shifts in the marketplace
    - Specific Lean Strategies
7. Lean TPM
    - What is it?
    - How can we take advantage of it?
    - Design Lean tasks
8. Lean Work Orders
    - Better machine histories
    - Training for mechanics, operations, and planners
    - Examples of Lean and Fat work orders
    - Specific techniques to reduce fat from your use of work orders
9. How to use your CMMS in a Lean way
    - Take advantage of your data
    - Where to get data to support cost-saving plans.
    - Exercise in developing a Lean CMMS protocol
10. Recreating your PM system to be Lean
    - Where is the waste in PM
    - Activity in PM and Lean Maintenance
11. Using technology for PdM inspection and Lean Maintenance
12. How to plan and schedule maintenance jobs for Lean execution
13. Practice in Lean Planning
14. Attack fat in the maintenance warehouse
    - Techniques to cut costs of acquisition
    - Methods to reduce costs of ownership
    - Activity in Lean Inventory approaches
15. Is safety Lean?
16. The goal: A Lean worker

Day 2 Lean Maintenance- Finding waste and the development of the Lean Project

1. Brainstorming sessions specifically designed to uncover waste.
2. Where to focus initial attention
    - Use this Priority system to ensure actionable projects.
    - Where to look for the 'low hanging fruit.'
3. Massive Lean Maintenance Project development
    - Groups set priority for each idea based on proprietary measures.
    - Groups develop a list of projects in priority order
    - Forms are offered to help groups refine and write-up one idea
    - Rigorous formats are employed to ensure plans are thought through and different aspects are reviewed.
4. How to conduct a cost analysis on a money-saving project.
5. How to get these projects done in the real world.
    - Assign management mentor that will provide:
        - Money that was budgeted,
        - Run interference,
        - Get supplies, help, faith, access to asset and resources, whatever else is needed
6. Present a Lean Project
7. How to write success stories. Pass stories on to management

Lean Projects in a school system

Gold **Effect on A/C electric consumption of increasing the set point of a school from 75.5 to 77 F.** The school wide set point in the Jupiter school was raised from 75.5 to 77. No complaints were registered. The electricity usage dropped by 10% resulting in a $7000-year savings per school with an immediate total approaching $315,000 (45 schools on DDC controls) for the district. Additional recommendations for savings from new thermostats in modular units. Gold star because there is little investment, large potential savings, and immediate returns.

Silver **Impact of the use of stabilizer on the consumption of chlorine in the pools.** The team added $225 of stabilizer to a pool. They charted chlorine usage for 1 week before and 1 week after stabilizer was added. Chlorine usage in the test pool dropped by $80 per week. Potential savings is $4000 per year per pool. Silver star is awarded because investment is small while the payback is large and immediate. This technique can easily be applied to all district pools where stabilizer is not being used.

Bronze **Impact of Ever-pure filter system to prevent corrosion failure in kitchen boilers.** The manufacturer increases the warrantee from 1 to 7 years if an Ever-pure filter is installed. Installation parts and labor are about $550. Current failure rates of 1 liner every 2 years will result in a savings of about $2684 in 7 years for each unit. 14 proposed Viking units would yield $37,500 in avoided maintenance costs over the 7-year warrantee. In addition there are over 50 boilers of other makes and models with equally high failure rates. The filter might help generate an additional savings of $134,200. This project was chosen because of the ease of the savings (from a warrantee), the real reduction in labor and the high cost of parts. If the technology proves to be effective the project can also be expanded to all the boilers in the district.

Compare circulating pumps. Project compares an existing cast Iron circulating pump to a smaller and lighter stainless steel pump. The smaller pump has been in use in the district for 7 years. Analysis of replacement cost, reliability, energy usage, complexity of installation shows that the smaller stainless pump is clearly superior. It costs $150 less to purchase, is more reliable, and uses about $7/yr less electricity. Recommendation: replace all circulating pumps with the stainless one as they fail.

Impact of relamping and cleaning fixtures on light output and electric usage. In a classroom where there were lighting complaints (room 12, Croton) the team replaced the tubes (with efficient ones), ballasts (with magnetic ones) and cleaned the fixtures. The candlepower at desk level increased from 12.5 to 56.8 (standard is 60). The amp consumption at the breaker went from 14 to 8. Total cost was $305 including labor at $25/hr. Electric savings $220/year. Several ballasts were leaking and were hazardous. Recommendation: create an annual campaign where each school chooses its worst 2-3 rooms for lighting. Teams will then re-lamp, re-ballast, clean fixtures. Based on the other relamping project high efficiency ballasts and utility rebates should be investigated.

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Managing Factory and Process Industry Maintenance

Who: This program is for all types of Factories, process industries, refineries, batch plants.

Attendees include maintenance managers, supervisors, leads, CMMS managers, planners, engineers, non-maintenance people accountable for maintenance, and people in training for these positions. There is also an advantage to having representatives from operations and stockroom for their perspective and input.

What: This 2-day class includes a spiral workbook and the text *Managing Factory Maintenance* Second Edition by Joel Levitt. We can schedule a tour of the production facility for insight into maintenance issues

Why:

- Sure-fire ways to justify your maintenance expenditures
- To integrate maintenance management into your overall strategy to increase competitiveness
- Techniques for calculating the real cost of breakdowns
- How to position your maintenance department to respond quickly to user demands
- Specific methods to reduce downtime
- How to cut costs in the storeroom
- What questions to ask to improve customer service
- To improve the MTTR (Mean Time to Repair) through planning
- To calculate the real cost from a change to PM and proactive Maintenance
- How to get operators involved and interested in maintenance issues
- How to cut expenses buying parts
- To evaluate existing or prospective CMMS
- What RCM is and how it applies to maintenance management

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Course Agenda for two-day Managing Factory Maintenance course
Day 1

1. Maintenance Fitness questionnaire
    - Initiation and authorization
    - Training, hiring, and development
    - PM, predictive and condition-based *
    - Planning, Scheduling
    - Guaranteed Maintainability
    - Purchasing, parts, and stores*
    - CMMS
    - Budgeting maintenance needs
2. Spare Parts
    - Parts management
    - Parts types
    - Insurance policy parts
    - Stocking policy
    - Consignment stores
    - Re-engineering.
3. Quick plant or process shutdown primer
    a. KPIs
    b. Phases
    c. Sources of work
    d. Validation
    e. Planned Job package
    f. Risk
    g. Resources
    h. Execution
    i. Shift schedules
    j. Shut it down
    k. Track
    l. Meeting Agenda
    m. Start-up
    n. Accurate accounting
    o. Completion
4. PM
    a. BOK (Body of knowledge) for Factories
    b. PMO basics
    c. TPM (Total Productive Maintenance)
        - Introduction to the use and implementation
        - Tips for valid task selection, task design, and management

Course Agenda for two-day Managing Factory Maintenance course

Day 2

5. CMMS Computerized Maintenance Management Systems
    a. Sample curriculum for a work order training class
    b. WO fill out Classes
6. Lean maintenance –do the right thing and save money
    - Where to look
    - Create lists
    - Good lean project
    - Proposal
7. A case study in Job Planning
    a. Review of Planning-Coordination-Scheduling-Execution
    b. 13 essentials of job planning
    c. Adopt our planning model to save time and money on the shop floor
8. Safety in Maintenance
    a. Performing a JSA
9. Ideas for action when you get back

Joel receiving an award from the CEO of SABIC for his keynote address at their Environmental, Safety and Health awards day in Jubail, KSA

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Facilities Management

Who: People concerned with office buildings, apartment complexes (large and small scale), sports venues, extensive facilities, airports, etc. Maintenance managers, building managers, supervisors, non-maintenance directors accountable for maintenance, leads, maintenance support people, and people in training for these positions.

What: This 2-day class is available in longer formats. Training materials include a spiral-bound workbook and a textbook *Facilities Management* by Joel Levitt. We can tour the training venue for insight into building maintenance.

Why: Our promise for this program is that you and your staff will have a new and more in-depth understanding of managing building maintenance effectively. This understanding will translate into reduced costs of operation and higher levels of user/tenant satisfaction.

- Lean maintenance for buildings
- To determine where you are and what changes are needed
- How to set up a work order system
- Understanding contracts
- How to set up a PM system
- Saving energy
- Motivation tips and tricks
- Samples of actual PM task lists
- How to estimate custodial work
- How to conduct craft training
- To increase efficiency for small jobs

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LASER-FOCUSED TRAINING

Taking a break in KL, Malaysia

2-day Facility Management Agenda

Day 1

1. What does it take to manage buildings and facilities?
2. What is the appropriate level of maintenance?
3. Lean maintenance strategies.
   - Ideas to save money.
   - How to cut energy costs.
   - Action exercise: Develop a money-saving project
4. Dealing with contracts.
   - Types of contracts.
   - Housekeeping contracts.
   - Bidding and bid packages.
   - Action exercise: Decide which party is right in a mock contract dispute.
5. Contractors
   - Steps of contracting.
   - Tips to avoid claims.
   - Getting the work done with contractors.
   - Choosing contractors.
6. Do work in-house.
   - Training.
   - Route maintenance.
7. Purchasing and stocking materials
   - Stocking and Purchasing Custodial supplies & materials.

2-day Facility Management Agenda

Day 2

1. Computerization,
   - Discussions of how systems work,
   - How to get more benefit from CMMS
2. Budgeting for maintenance and housekeeping
3. Action exercise: Maintenance fitness questionnaire
4. Get Maintenance Organized,
   - Maintenance work order,
   - Auditing existing systems.
5. Management of Housekeeping
   - Estimating housekeeping
   - Quality inspection process.
   - Action exercise: estimate housekeeping for a school,
   - Doing quality inspections in hotel
6. PM Preventive Maintenance

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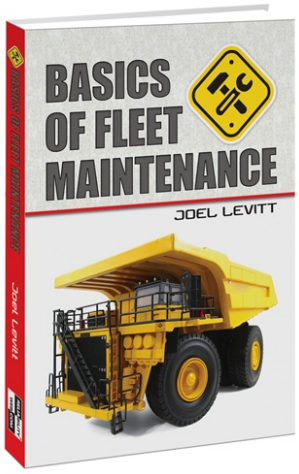
Basics of Fleet Maintenance Management

Who: This program is for Fleet managers of all kinds of fleets, Port equipment superintendents, shop managers and directors of transportation, supervisors, other executives, or managers with fleet responsibilities, and anyone being promoted into these jobs.

Fleets covered range from Port operation, taxicabs, mobile construction equipment, rental, transit and minibusses, mixed municipal fleets, common carriers, private carriers, and mining equipment. This course is for any organization that owns or operates multiple pieces of mobile equipment.



What: The basics of Fleet Management is a 2-day class with a spiral-bound workbook and a text *The Basics of Fleet Maintenance* by Joel Levitt

Why: Running a fleet is managing thousands of details where any one of which could be critical. This 1-day class focuses on distinguishing the important from the unimportant and how to identify the vital vehicles, mechanics, vendors, or operators that are costing you money.

This course will offer specific ideas to reduce road calls, reduce fuel consumption, trade units, how to slash paperwork, improve warranty recovery, and help you understand what to manage to have an impact.

- What are fleet management's responsibilities with an overview of responsibilities, benefits of active management, alternatives to management, quality of life issues?
- How to conduct a fleet self-audit with how to measure a fleet operation,
- How to collect usable data for future analysis from the repair orders
- Identification of the five major cost areas
- VMRS (Vehicle Maintenance Reporting Standard), the use and misuse of the repair order.
- Pre-planning steps for change include laying the groundwork for changing your systems, how to prepare superiors and subordinates, eight specific projects to get control, finding waste.
- Improving maintenance systems with PM, PdM, PCR, accurate cost analysis, avoiding crisis mode of operation.
- Attacking the major cost areas of labor and parts with methods of evaluating labor productivity, improved scheduling, managing the stockroom, and reducing inventory levels.
- Where to attack ownership and operating costs
- When and how to trade, Improve warranty recovery, loss prevention.
- Rules to Improve your shop layout for efficiency

Basics of Fleet Maintenance Management 2-day course Agenda

Day 1

1. Issues of fleet
   - What is fleet management?
   - Why manage it?
   - Alternatives
2. Fleet Maintenance Fitness Questionnaire
   - Job assignment dissonance questionnaire
3. Planning projects
4. Selling Improvements to your Management
   - Life Cycle Cost
   - Return on Investment calculations
5. Goal: Longer life with less effort
6. Maintenance cost evaluation
   - True Cost of Labor
   - The real cost of a part
7. Breakdowns
8. PM strategies
   - Predictive Maintenance
   - Setting up a PM system
9. MRO spares inventory
10. Outsourcing

Heavy Haul Truck at Syncrude in Ft McMurry Canada

Basics of Fleet Maintenance Management 2-day course Agenda

Day 2

1. Fuel
2. Tires
3. Safety and insurance
4. Buying and selling vehicles
   - Vehicle specification
5. Alternative use
6. Fleet audit
7. Productivity
8. Staffing roles and number of people
9. Shop design
   - Tools and equipment
10. Shop scheduling and Work Standards
11. Repair Order
    - VMRS
    - CMMS
    - DVIR
12. Budgeting Maintenance
13. Measurement of Fleet Performance
14. New Technologies
15. 50 Notes to take with you
    - Build a better fleet system

A Fleet can have different equipment. Pictured is a farm implement at TADCO (a 70,000 acre farm) near Tabuk, Saudi Arabia

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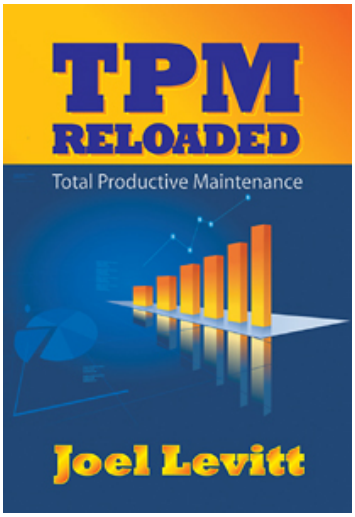
TPM (Total Productive Maintenance) Operator Care

Who: Unlike almost any other maintenance strategy, TPM is primarily housed within the operation group, so full participation from operations at all levels is essential.

The other unique aspect is that while TPM is driven by top management, it is primarily an operations worker effort. The direct manufacturing workers need to be trained in their new roles. Besides, maintenance supervisors, managers, PM leads, PM workers should attend because they will serve as facilitators and trainers. Your in-house experts can conduct shorter training (after we train them and supply them with suitable training materials).

What: This course is offered in a variety of formats for different audiences. The student receives a spiral workbook and the text *Lean Maintenance* by Joel Levitt



Why: TPM draws in the entire workforce and has a powerful impact on the plant's complete output. The most challenging lesson is how to keep TPM going after the initial roll-out. One of the keys presented here is a comprehensive understanding of what to do, why to do it, and what's in it for the worker.

There is much to know to design productive TPM activity for different types of equipment. In a short time, this course will bring an entire department to a deeper understanding of how to make TPM more effective.

Specific Benefits from this TPM training

- See TPM from the worker's position
- Are you ready for TPM?
- What steps to take to start TPM?
- Where does the return on Investment come from TPM?
- Learn everyone's roles in TPM
- How to design TPM tasks
- Answer the question what would it be like to work in a TPM shop?
- Provide agenda's for TPM team meetings
- How to use your CMMS with TPM
- How to teach TPM skills to operators
- What to train operators
- How to manage TPM after the thrill wears off

This course is available in a long program (3-day as shown immediately below suitable for candidates wanting set-up TPM, to be TPM trainers or want to see the whole picture) and short program's for operations and maintenance personnel

Course Agenda for 1-day TPM class:

- Chapter 1 Introduction to TPM
  - Who is TPM for?
  - What Does TPM Do?
  - Why the results from TPM are urgent today
- Chapter 2 Talking About TPM
  - Total plant involvement
  - A Day in the Life of a TPM Shop
- Chapter 4 TPM basics
  - The intention of TPM is engagement
  - TPM: The Basic Idea
  - TPM is a TEAM Based Activity
  - Five Elements of TPM
- Chapter 5 Maintenance
  - The Basic Activity of TPM is PM
  - PM is…
- Chapter 6 OEE (Overall Equipment Effectiveness)
  - Measuring Equipment Effectiveness is an Essential Part of TPM.
  - OEE for a donut shop
  - Examples of OEE
- Chapter 7 TPM activities
  - Return to new conditions
  - Mini-manual for Operators
  - Tasks (Getting Down to the Nitty-Gritty)
  - Explicit versus Implicit tasks
  - Functional TPM tasks have some things in common
  - Possible tasks for TPM trained operators
  - TLC (Tighten, Lubricate, Clean)
  - How to choose the best tasks
  - Team meetings
  - Typical team activity is conducting a 1-point lesson
- Chapter 8 Facts of Life
  - What Are We Trying to Do?
  - One Problem However – Past Sins
  - What are the Life Cycle Phases of Equipment?
- Chapter 9 CMMS
  - The CMMS Work Order
- Chapter 10 Visual Work Place
  - Benefits
  - Examples
  - When is too much too much
- Chapter 12 Training
  - For TPM to Work, You Better Be Great at Training.

My action Plan

The course is available in 1, 2, or 3-day configurations

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Maintenance Inventories

Who: Senior and middle-level executives from Operations & Maintenance, Materials, and Finance. Storeroom managers, parts clerks, storeroom trainees, purchasing agents and buyers, and maintenance planners. There is also an advantage to having maintenance supervisors, maintenance engineers, and representatives from operations for their perspective and input

What: Every student gets a textbook and comprehensive spiral-bound workbook

Why: Our promise for this program is that your storeroom personnel will be conversant with effective Maintenance storeroom management and inventory control. They will be able to cut the number of SKUs, reduce the number of stock-outs, and reduce the overall inventory level

In the maintenance of factories, fleets, and buildings, the parts and materials consume 40-70% of the budgeted dollar. Maintenance inventories can run millions of dollars. More so than paying for the stock is the possibility of downtime and lost production from having the wrong parts.

This course will help organizations cut their stock levels, cut the number of items on the shelf while simultaneously reducing stock-outs. Techniques will be demonstrated to use the original parts as pointers to areas ripe for cost reduction. Students will come away with an excellent overview of managing a maintenance storeroom and up-to-date techniques for dealing with these issues.

A few of the things you will learn:

- How to explain critical parts
- What a great stock room looks like
- What parts to carry and why
- How to reduce your inventory level and increase your service level
- How to calculate safety stock
- How maintenance strategy impacts stocking decisions
- Improve stockroom layout and improve the picking speed
- How to apply Lean Maintenance to Stockrooms
- Rules of using the CMMS for storeroom

Learning objectives

- The role of the maintenance inventory so you understand what decisions to make and why.
- Fighting indiscriminate maintenance inventory reductions
- How to reduce the inventory level without compromising the mission
- Strategies to reduce costs of ownership and costs of acquisition of parts
- Get operations on your side with downtime arguments
- How to do a 1-hour audit of the storeroom

- How to set up the CMMS master files to manage the inventory
- Learn the best practices for the layout of the storeroom
- Use your actual business requirements to drive inventory level decisions
- How to categorize parts to the criticality of equipment

Optimizing Maintenance Inventories 2-day course Agenda

RED Exercises BLUE Case studies

Day 1

1. Vision for maintenance and the stockroom- why are we doing this
    - World-class maintenance and the inventory system to support it.
    - Serving the mission of the organization
    - Business requirements and inventory decision making
    - Organizational set-up
    - How the inventory and a stockroom fit into the big maintenance picture.

2. Basics
    - A slew of definitions (the stockroom world has unique language)
    - Common comments about Good and Bad stockrooms
    - Benchmarking
    - What are the functions of the maintenance inventory?
    - Types and uses of inventory.
    - Inventory that is not inventory
    - Different categories mean different management strategies. Evaluate types economically, including Insurance Policy spares, capital spares, and consumables.
    - Get operations on your side with downtime arguments

3. Storeroom Management
    - Storeroom business process review

4. Computerization
    - Computerization assessment
    - Inventory start-up including parts catalog, parts numbering strategies, parts naming strategies
    - Data necessary to manage the inventory
    - Using the CMMS to manage inventory
    - Reports
        - Parts Catalog
        - Rules of a computer-aided maintenance stockroom
        - How Computerized Inventory Control can reduce stock-out and obsolete parts

5. The Physical Stockroom
    - Functions of the physical storeroom
    - Sizing the storeroom
    - Ideas for the layout of the storeroom
    - How to conduct a physical inventory
    - Counting strategies including cycle counting and counting frequency

- Preservation, security, and safety of materials

6. The Economic Stockroom
   - Choose ten parts that meet these descriptions
   - Inventory control models, Economic analysis including EOQ, safety stock, minimum/maximum, ROP, cost of acquisition, etc.
   - Real costs of maintaining a storeroom
   - Benchmarking maintenance inventory-
   - How to save money

7. Economic analysis
   - What is the real cost of an item in your inventory?
   - How to reduce your maintenance inventory level and increase your efficient use of capital
   - Big-ticket analysis
   - Procurement costs
   - How much is enough? Types of demand

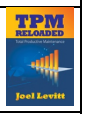
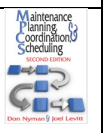
8. Dealing with the Part itself
   - Procurement: purchasing, parts interchange, and supplier identification,
   - Obsolete/redundant/surplus materials (reasons for obsolescence, how to minimize its impact, the cause for surplus items, their designation, and disposal action.)
   - Standardization and codification
   - ABC inventory management
   - E-MRO
   - Rebuild versus new. Make versus buy, OEM verses make outside considerations.
   - Strategies for transferring the inventory function workload including consignment, vendor contracts, rack jobbing, offsite guarantees, outsourcing

9. Helping the purchasing department save money, give them your conclusions on these issues:
   - Ideas to improve the purchasing maintenance relationship
   - Have you considered different vendor relationships?

10. Managing rebuildables

11. Wrap-up and action plan

Books by Joel Levitt

Newest publication- Due out December 2020 **Management Skills for Supervisors and Team leaders: This is one of the few resources for supervisors and floor maintenance leaders. It introduces the skills and knowledge to deal with the myriad of issues supervisors face.**
The Quest for Defect Elimination: Quest for Defect Elimination is a full-color graphic novel that provides the basics of defect elimination and shows the Quest to achieve fewer defects. In the manufacturing world, fewer defects mean better quality, better yield, higher energy efficiency, and fewer machine breakdowns. In the world of equipment maintenance, fewer defects lead to fewer failures and higher reliability.
10 Minutes a Week to Great Meetings: This book will improve your meetings by impacting specific areas, including preparation, participation, facilitation, logistics, and follow-up. Improving your meeting expertise will make you more valuable to your organization, be more productive, and feel better about your contributions. Meetings are everywhere in modern organizations because no one has found a better way to get business done. Yet people who attend or even facilitate meetings also complain that they are wasteful, de-energizing, and demotivating.
10 Minutes a Week to Great Time management: Companion book with the meetings textbook above. A model will improve time usage and time understanding. Helps maintenance professionals make better use of their time and get more done.
Facilities Management- Maintenance of Buildings and Facilities: Facilities management is a broad-based discipline that calls into play architectural, construction, engineering, and administration and social skills-- particularly for running and maintaining commercial, institutional, academic, and industrial buildings. This book will cover the essential roles. The book contains excellent, ready-to-use assessment forms and resources for comprehensive practical information. 
Basics of Fleet Maintenance is a comprehensive look at the management necessary to run a fleet in today's environment. It includes audits, worksheets, ideas for all aspects of fleet maintenance. Topics include life cycle costing, storeroom management, shop layout, supervision, CMMS, budgeting, PM, and other essential issues. Written for new managers and people in training for that position as well as directors responsible for fleets. 
TPM Reloaded: This is a new look at implementing Total Productive Maintenance (TPM). The book considers the economic upheavals of recent years and demonstrates that TPM is less about moving maintenance tasks to operations than moving accountability for aggregate output of the plant to operators. Practical TPM requires a radical difference in management's view of the worker and a drastic change in the way workers view their role. 
Lean Maintenance: Written for leaders in maintenance, storeroom, or production. A practical book, Lean Maintenance, takes the reader on a journey, uncovering sources of waste, designing projects to address inefficiencies, selling projects to management and delivering project results. Every area in maintenance is covered, including your TPM effort, storeroom, PM tasking, work orders, and computer systems. Readers put these ideas to work right away, saving money, energy, and the time immediately! 
The Complete Handbook of Preventive and Predictive Maintenance: A culmination of 20 years of research, teaching, and consulting, this book shares the best practices, mistakes, victories, and essential steps for success gleaned from working with organizations around the world. Unlike other books that only focus on the engineering issues (task lists) or management issues (CMMS), this in-depth resource is the first to give actual emphasize to the four aspects of success in preventive maintenance systems: engineering, management, economic, and psychological. 
Managing Maintenance Shutdowns and Outages: This long-awaited work organizes the details of a maintenance shutdown into manageable segments by introducing the steps needed for a successful shutdown or outage. Loaded with examples from many industries and actual events, this book provides useful and practical guidance for maintenance managers, project engineers, supervisors, maintenance engineers, and planners working in any heavy maintenance environment. 
Handbook of Maintenance Management: Now, in its second edition, this comprehensive and easy-to-understand resource reviews all the significant discussions going on regarding the management of maintenance. It's the perfect reference for maintenance professionals, providing quick updates on every specific maintenance management subject. 
Managing Factory Maintenance: This new edition of a classic educates readers about the globalization of production and the changing of the guard of maintenance leadership, providing practical solutions to aid in these areas. Comprehensive discussions of potential problems and new opportunities, what bosses want, specifics for improvement of maintenance and production, world-class maintenance management practices, quality improvement, process aids, interfaces and strategies, personal and personnel development strategies. 
Maintenance Planning, Scheduling, and Coordination: Well-planned, properly scheduled jobs accomplish more work, more efficiently, and at a lower cost. This handy reference focuses on the groundwork that leads to the most effective utilization of maintenance resources. A vital training document for planners, an educational document for management, and a valuable guide for those who interface with the planning and scheduling function and depend on the many contributions of planning and scheduling operations. 
Conversations in maintenance is a collection of maintenance observations over the last 20 years from columns in trade publications.

All Titles by Joel Levitt on Amazon.com http://amazon.com/author/joellevitt

People Trained by Joel Levitt: Public sessions: 15,000 from over 3000 organizations in 21 countries in 500+ sessions. **98% rated them very good or excellent.** **Private training location of pictures in bold red**

Mining: Iron Ore of Canada, Imetal, Blue Circle, Clark Elkhorn Coal, **South Deep (South Africa),** Usibelli Coal, Windalco

Oil and Gas: Citgo, **Syncrude (Canada),** Esso Canada, Conoco Phillips, Emirati Oil (Dubai), ADCO (Abu Dhabi Oil Company), BP (Port Newark), Atlantic Liquefied Natural Gas, Valero

Food and pharmaceutical: Pepsi, Abbotts Labs, Wyeth, Merck, Con Agra, Fleur du Lait, **Tadco (Saudi Arabia)**

Primary manufacturing: Alcoa, Prince George Pulp and paper, Reynolds Metals, USX, Simpson Timber, Holcim Cement**, Arawak Cement (Barbados)**

City, Airport, University: Seattle Airport, Philadelphia International Airport, **St Maartin Airport,** Portland International Airport, Jefferson University Hospital, University of Texas, MD Anderson Cancer Center, Univ. of Alabama, City of Edmonton, Dominica

Manufacturing: Lego, Cisco, GE, Philip Morris, Sony, MECCO, Harley Davidson Motorcycle, Saturn (GM), Volvo, Degussa, Montel, MPI, Worthington Steel Algoma, Toray Plastics, Hood Industries, **Mercedes Benz**

Government and contractors: US Army Corps of Engineers, Raytheon, US Coast Guard, US National Security Agency, Defense Logistics, Lockheed, US Navy, US Army, Ft Meade, KRS**, 3DRO (Kwajalein Atoll-Marshall Islands),** H.B. Zachary

Also Utilities: New Foundland Hydro, (Scottish Power) PacifiCorp, American Water Works, Derry Township Sewer Treatment, MidAmerican **Transportation:** Washington DC Metro Area Transit, Dallas Area Rapid Transit, CSX Railroad, NJ Transit, Loram

JDL@Maintrainer.com for questions

Springfield Resources' President Joel Levitt has provided training in the management of maintenance for 29 years. He has trained over 20,000 maintenance professionals in 600+ classes in 39 countries. 98% rated the course very good or excellent. Some of the organizations for which he provided training in public settings include:

SABIC (PM training), ADCO Oil (Supervisor training, main mgmt.), Toronto Peterson Airport, Emirate Oil (many classes), TADCO (planning), Cisco, Newcrest Mining (planning, supervisor), Valero Oil (planning), CUF (Shutdown), Syncrude (shutdowns), Holcim Cement, Atlantic LNG (Planning), Blue Circle, Ft Meade, BP (Port Newark), SAP, Pepsi, Saturn (GM), New Foundland Hydro, Placer Dome, Rayonier Fiber, Volvo, Con Agra, Esso Canada, US Army Corps of Engineers (Dam on the Red River), Southdeep Gold Mine (CMMS project), Iron Ore of Canada (planning), Salt River Project (Planning), Washington DC Metro Area Transit, NJ Transit, US National Security Agency, Lockheed, Blue Circle Aggregates, Usibelli Coal, GE Plastics (management), Wyeth (Planning), Toray Plastics, Abbotts Labs, Imetal, Merck, Prince George Pulp and paper, USX, Jefferson University Hospital, Clark Elkhorn Coal, Defense Logistics, Philip Morris, Sony, CSX Railroad, Harley Davidson Motorcycle, Sappi Fine Paper, US Navy, H.B. Zachary… more every month

What organizations say about Joel Levitt's Maintenance training.

"I have found Joel Levitt to be the most realistic and practical trainer I know. He can relate with the whole facility from the shop floor to the boardroom."
Steve Lindborg, Holcim (US) Inc. GM Theodore Plant

Dear Joel;
I have attended many maintenance training courses, but none made the maintenance concepts so easy to understand and quite possible to adopt. We had a great time enjoying the way you delivered the message. I heartily wish you all the best.
Chief Operation Officer Ali O M Adam TADCO Saudi Arabia

Follow up note Ali O M Adam:
Lots of thanks for this effort. This class will help a lot in the implementation process. Already we formed a follow-up committee for the training concepts implementation. The points you highlighted will be given enough attention to grant smooth implementation.

I appreciate your great assistance that spotted a light towards many dark areas in our maintenance activities. Showing others how to do things right in a friendly way is a great value, rare to find in today's world.
BEST REGARDS. Ali O M Adam

"My entire Maintenance department has changed for the better because of what I have taken from these classes."
John Mullinax, Maintenance Manager, AXSYS Technologies, Inc.

"Extremely experienced & Knowledgeable Facilitator. Real-life pertinent examples. "
Nicole Kalloo of Nealco Properties Trinidad

"THANKS TO JOEL LEVITT" from REUBEN PARIAG *see below:*
Dear Mr. Pariag,
I am pleased to inform you that you have passed the Planning and Scheduling examination taken on 27th November 2009 at the University of the West Indies St. Augustine Campus scoring a total of 92%...

"The program makes you a better Maintenance person. "
Henri Gau–Gau of Maritime Authority Trinidad

The instructor obviously very knowledgeable in the field and communicates effectively. "
Kayode Martin of T&TEC Trinidad

Good content, very practical application to our maintenance practices.
Raffie Musaib Ali of Powergen Trinidad

"It was interesting to hear Joel basically reinforce what Grahame Adams and I had worked out here at Queensland News. We have introduced a couple of his tools in our planning function. To sit with other planners doing similar jobs was of a benefit, as the cross-pollination of ideas is always advantageous. Thanks for the opportunity to be a part of the workshop.
John Kluver, Engineering Supervisor, Queensland News, Australia