

BUILDING OPERATING MANAGEMENT'S

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Your Advantage in Facilities Management

Training and Assessments for Your Maintenance Staff

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Billions are Spent on Training Every Year

All training:

- US companies spent \$134 billion on training last year. This was a rebound from a low in 2009 (\$129 b), and is expected to grow 7%-9% for 2011. This number had increased steadily over the past 10 years, up from \$95 in 2000. (American Society of Training & Development)
- The average company spent \$1000/year on employee training (internal and external), and devoted 36 hours/year for each employee to be trained in 2009. The average employee took 1-2 courses during the year.
- Learning as a percent of payroll has increased as companies have leaner staffing, but spent a larger percent overall (around 2.3%).

Billions are Spent on Training Every Year

Industrial training:

- \$12 billion was spent on industrial training in 2010, up slightly from 2008/ 2009 levels, which was down primarily due to the downturn in the economy and overall corporate cutbacks in employees and programs. (TrainingIndustry.com)
- For trades/laborers, 27% took some type of work-related training in 2009, with 25% through external sources. (US Dept of Education)

Billions are Spent on Training Every Year

CONCLUSION:

- US companies are spending a lot of resources (money and time) to train their employees.
- Are they utilizing the correct training (courses, subject matter, etc.) to meet their short and long-term needs?
- Assessments are vital in providing “direction” to ensure that their current and new employees are trained to effectively perform the tasks assigned to them. By better understanding the people that they employ, companies can solve many of their most critical and expensive problems

Billions are Spent on Training Every Year

This is especially critical when considering the following from surveys:
(IDC, TTC)

- 25% of employees misunderstand their jobs
- 1/3 of companies don't address knowledge gaps, even when they know where they lie
- Many companies only use assessments for pre-employment...this is the last time that their people are assessed
- 80% of maintenance personnel scored less than 50% of where they need to be to perform their jobs.
- Literacy levels for maintenance workers may be a problem. In some parts of the country, up to 40% are reading below the 8th grade level.

Billions are Spent on Training Every Year

Training impacts productivity significantly: (US Dept of Education)

- Increasing an individual's education level by 10%, increases their productivity by 8.6%
- Increasing their work hours by 10% only increases their productivity by 6%
- Increasing capital stock by 10% only increases productivity by 3.2%

Billions are Spent on Training Every Year

Maintenance skills facts:

- Most companies do not have fully skilled maintenance personnel
- You cannot fire everyone that is below standard
- Hiring skilled maintenance personnel is difficult
- Most repetitious equipment problems that cost companies billions of dollars a year are a direct result of skill deficiencies
- A person that feels competent is a better worker and is easier to motivate

Billions are Spent on Training Every Year

The cost of incompetency:

- Training is often perceived as a cost, but it is actually an investment. There are consequences from a poorly trained maintenance staff:
 - Increased maintenance costs- Due to untrained/poorly trained employees, inaction and missteps will add labor to the costs of repairs.
 - Extended downtime- Longer repair times, and repeat downtime keep the machines idle longer.
 - Unsafe acts- Improperly trained employees may endanger themselves and others.
- Trial & error during normal facility operations is the most expensive form of OTJ training.
 - The National Board of Boiler Inspectors reported that in 2000, poor maintenance was the cause of 42% of power boiler incidents.

Assessments: Overview

- Assessments are a tool for training. They are designed to determine the knowledge and skills of their employees, and how that compares to their current and future needs. This is especially critical for maintenance technicians, where their skill sets are constantly evolving.
- Assessments provide valuable input for development of targeted training plans, avoiding costly ‘one size fits all’ plans.
- “Employee understanding and competence are increasingly being recognized as critical operations issues, rather than just routine areas for HR to address. A comprehensive assessment program can map technician’s actual skills and knowledge against the landscape of skills needed for a particular job.”

- Mary Clarke, CEO, Cognisco

Assessments: Overview

Assessments can be used for 3 purposes:

- Current employees
- Job transfers/promotions
- New hires

Assessments: Overview

Assessments can be used for 3 purposes:

- **Current employees:** Allows for us to determine the actual skills and knowledge of each individual employee, as well as the collective knowledge of the department. Once “knowledge gaps” are identified, targeted training plans are the next step. Remedial training may be needed for poor reading/math/computer skills prior to “mainstream” training.

Assessments: Overview

Assessments can be used for 3 purposes:

- **Job transfers/promotions:** Allows us to determine the knowledge of each individual to determine if they are a good fit to be moved into a new position within the facility. These people may be within the maintenance tech area, or from another area (production, etc.). Combined with other evaluation parameters (personality, aptitude, management skills, etc.), skills assessments can provide valuable direction to management for these personnel issues. This allows for objective promotions based on measured knowledge and ability (helps avoid lawsuits).

Assessments: Overview

Assessments can be used for 3 purposes:

- **New hires:** Once skills/knowledge benchmarks have been established for various jobs, assessments are an efficient cost tool to avoid costly poor hires that either leave quickly or negatively impact the productivity of the department/facility.

Assessments: Overview

- Assessments (followed by targeted training) become a vital part of a company's training progression (apprentice, trainee, journeyman, expert, etc.).
- According to the Harvard Business Review article "Job Sculpting- The Art of Retaining Your Best People", assessments allow for companies to better match people to their jobs, which leads to a more productive and satisfied employee, reducing employee turnover.

Assessments: Evolving Needs

- Effective management of people always involves training. Assessments of the department's core competencies, plus each person's specific competencies is critical. However, the job tasks, equipment and processes on the plant floor are constantly evolving. Assessment and training must evolve with these changes.
- In addition, as companies are "leaning" their maintenance departments, more techs are moving from single-craft to multi-craft responsibilities. An expert electrician, now responsible for other crafts, must hone their mechanical skills in order to provide management with the flexibility to schedule/assign maintenance tasks.

Targeted Assessments

- In order to properly evaluate the skill/knowledge levels of your maintenance staff, we recommend utilizing specific, industry-developed tests to determine the levels of each individual. This enables us to recommend the proper courses to close the “skill gaps” and establish a baseline for all current and future maintenance employees.
- These assessments provide actionable feedback designed to ensure that “you know what they know”, and can assist in matching their expertise to their jobs.

Assessment Areas

Assessments must cover the core and specific competencies relating to the vast array of plant maintenance functions.

- Core competencies:
 - We recommend that all maintenance techs be assessed in the core competencies...the areas that are the foundational “blocks” for all other learning.

MECHANICAL SYSTEMS

ELECTRICAL SYSTEMS

FUNDAMENTALS

- This ensures that all the techs have the same common understanding of the underlying principles that are the basis for all “advanced” areas.

Assessment Areas

Specific competencies:

- We then recommend adding on custom selected topics to include a range of assessments within 20+ job-specific categories, some of which are noted below:
 - Electronics
 - Mechanical maintenance applications
 - Air conditioning & refrigeration
 - Process control instrumentation, PLC's, and microprocessors
 - Hoists & rigging
 - Machine shop practices and machine tools
 - Maintenance management

Assessment Areas

- This ensures that each tech has been assessed in the areas that they work in daily, so that they can be trained to perform more efficiently on the plant floor. Depending on if they are single or multi-craft, these additional areas can be easily added in “modules” to their assessments.
- The range of topics needs to be extensive enough to accurately address all employees functions, yet be focused enough to manage, implement and direct training needs.

Assessment Questions

- In addition to the topics being custom fit to the company/ employees, we also recommend custom designed assessments.
- A typical assessment on a specific subject (i.e.- DC equipment and controls) should have 35-50 questions that enables us to determine their strengths & weaknesses on the subject. However, there may be questions that may relate to their specific job descriptions or the company's equipment, that are either not on the assessment, or should be eliminated from the assessment.
- There should be a pool of 5000-7000 questions across all disciplines/skills available to ensure that we ask the right questions and don't ask the wrong questions.

The Process: Selecting Topics & Questions

- Management should be provided with an extensive listing (with brief descriptions) of the wide range of standard assessments available for internal review. Management would then work with the training organization to select the assessments (by subject/topic) that best fit with their specific maintenance needs.
- The next step (optional) is for both parties to review each individual question within the selected assessments to determine what questions do or do not apply to your specific plant environment and your maintenance staff's responsibilities (may vary by job title within the maintenance department).
- These 2 steps provide a manageable, actionable meaningful list of assessments/questions.

The Process: Selecting Topics & Questions

- We recommend that each assessment not exceed 50 questions (normally around 1 hour to complete) to allow for the attention span of the techs who typically are used to being on the plant floor working with their hands, not sitting at a computer taking a test.
- Once this is completed and the final assessments are approved, they are made available (online) for your staff to take as their schedules allow.

The Process: Evaluation & Reporting

- We recommend periodic reports on each individual's and the department's collective progress throughout the process (who is finished/in process, percent assessments completed, average scores, etc.).
- When all assessments are completed, a final report should be provided that includes the scores and the recommended courses for each individual. This should include an evaluation of each individual, plus an overall evaluation for the department that shows how each individual scored against the department average, and where they placed (below average, average, above average, top percentile, etc.), as well as benchmarks for the department (to be used for new hires, transfers, etc.).

The Process: Evaluation & Reporting

- These reports provide quality direction for recommended training (hands on/online) to close the “skill gaps”. It then becomes a collaborative effort with management to schedule the recommended classes. It is imperative to prioritize the classes based on current needs and impact (most “bang for the buck”).

Department Assessment

- Additionally, there may be the need to assess the entire maintenance department/process, and make recommendations to ensure that they provide a more efficient support function for the plant operations.
- This is accomplished through spending time on the plant floor, observing the daily operations of the department, asking questions of management and the “front line” workers (the techs), and reviewing the processes and policies of the department and how they fit in to the entire operation.

Budgeting & Timing

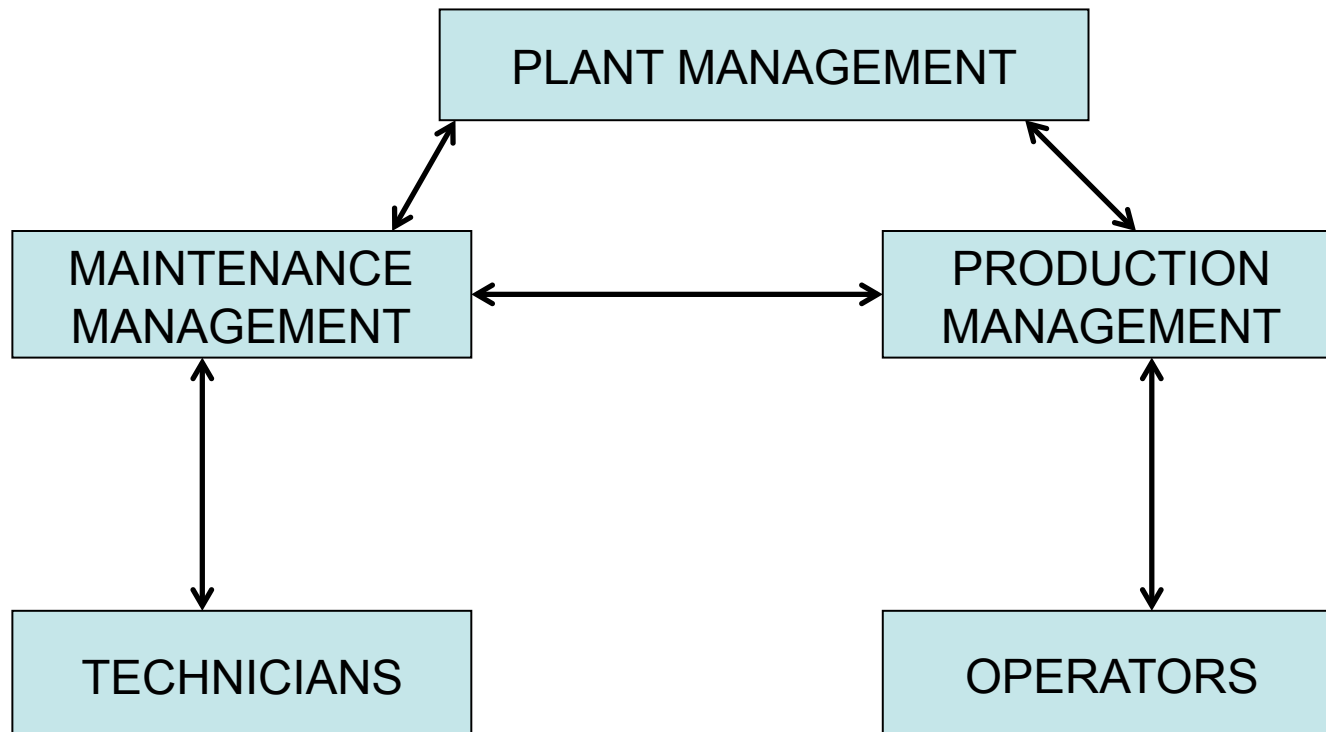
- If you have 100 technicians, you should expect to pay an outside training organization approximately \$35,000-\$45,000 to develop and implement a custom assessment program.
- Depending on the scale of the project (number of assessments, number of participants), it should take 1-2 months to develop/certify the assessments, 2-3 months to administer the assessments, and 1-2 months to analyze the results and develop a training plan.

Next Steps...Training

- We recommend that all technicians (and operators) take a general troubleshooting class prior to beginning their hands on class schedule.
- Based on the assessment results, current priorities, and scheduling, hands on classes should start as soon as possible. There should be time between classes for the technicians to apply on the floor what that they learned in a class before beginning the next class....”use it or lose it!”

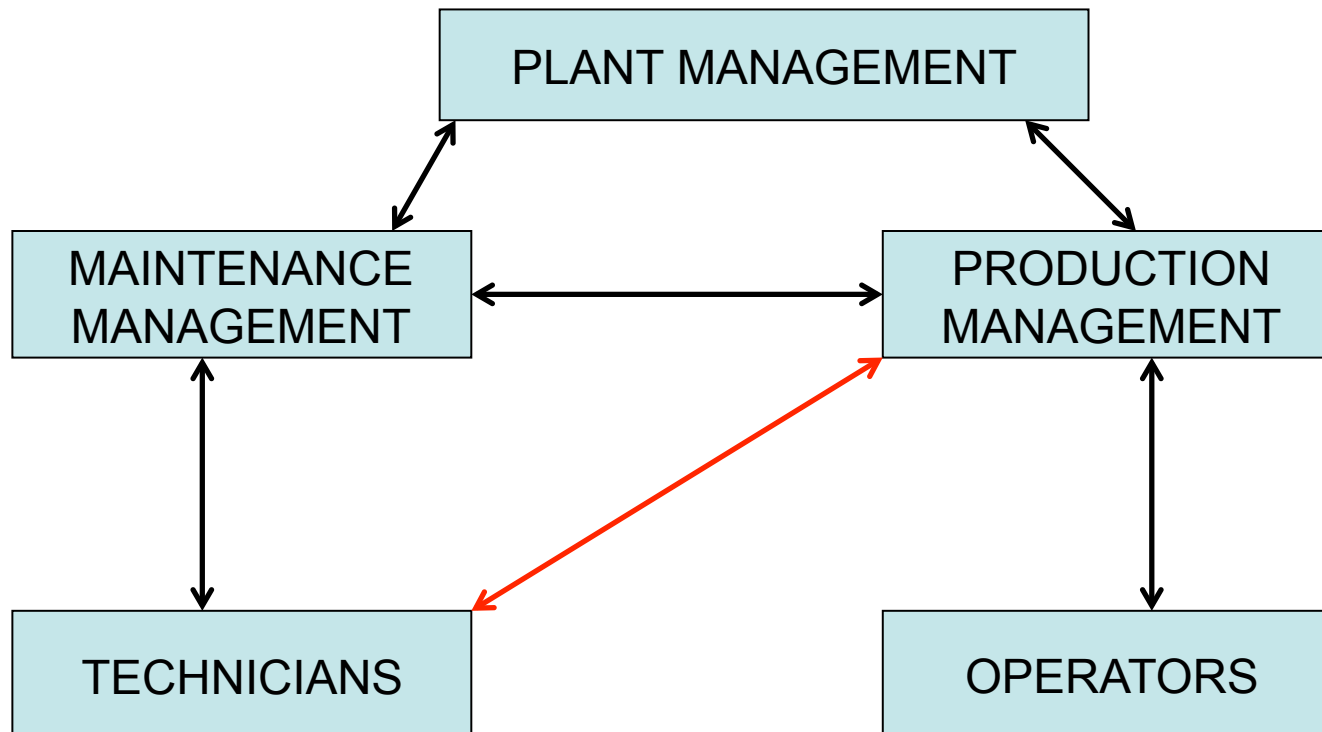
LEVELS OF TRAINING

TRADITIONAL



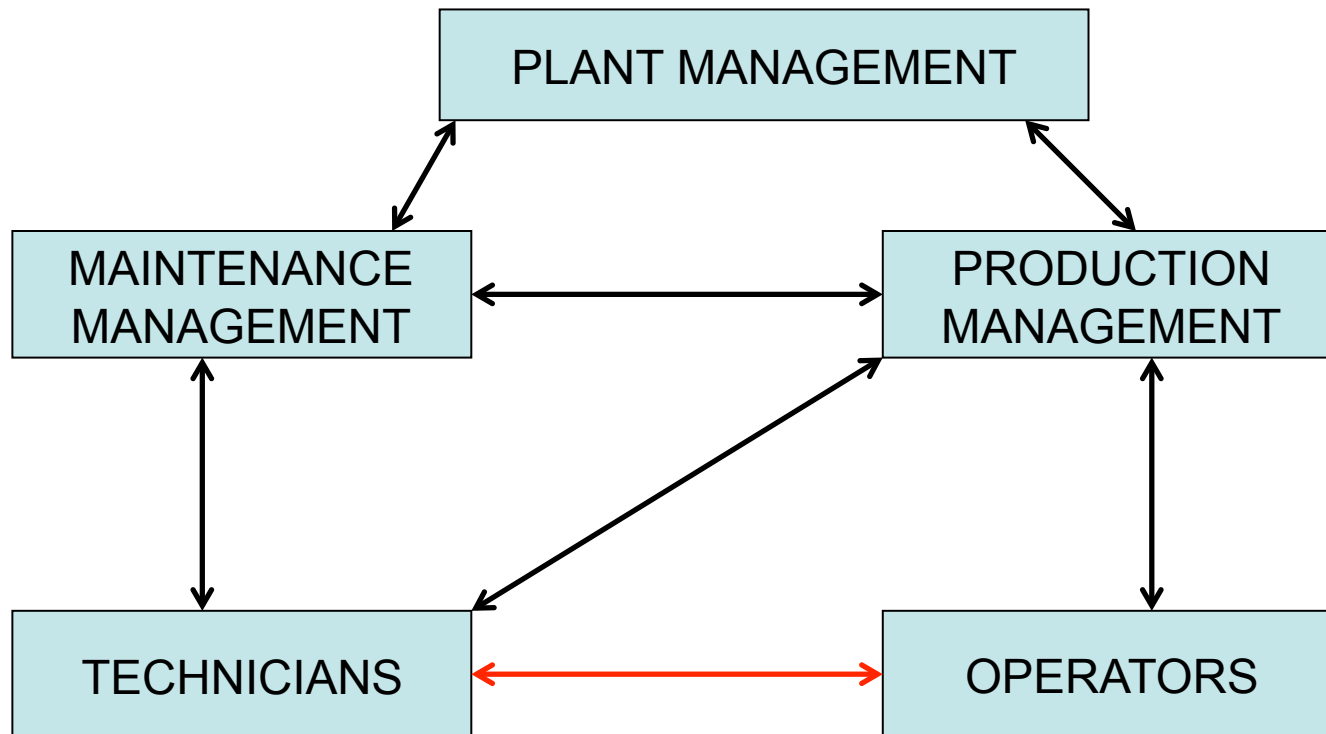
LEVELS OF TRAINING

OPENNESS & COMMUNICATION: STEP 1



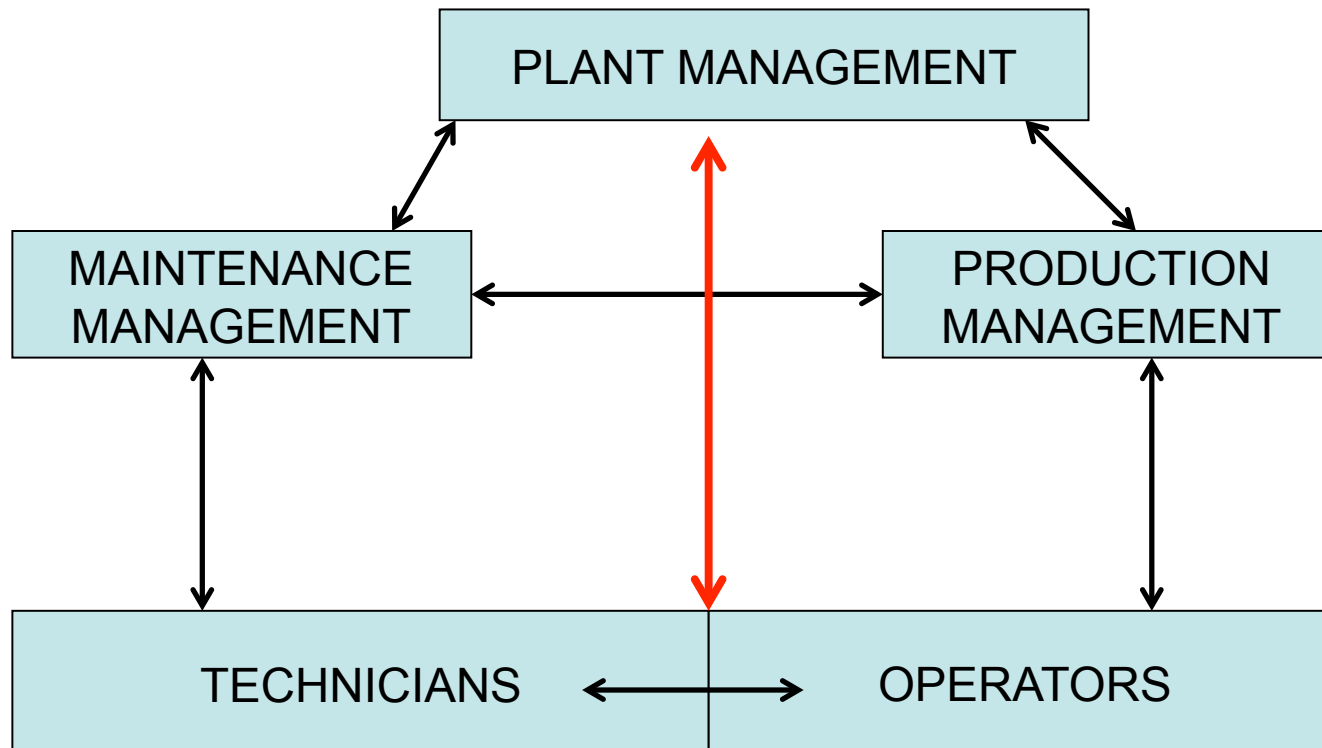
LEVELS OF TRAINING

OPENNESS & COMMUNICATION: STEP 2



LEVELS OF TRAINING

OPENNESS & COMMUNICATION: GOAL



KNOWS: schedules, priorities, issues, active involvement, pay affected

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Conclusions:

- Training without assessments provides a “shotgun” approach...you just might get something.
 - Assessments provide the “targeting” to ensure that the right people learn the right things.
- They also provide an evaluation tool to measure the effectiveness of your training plan.

MPACT SOLUTIONS

- MPACT Maintenance & Reliability Solutions (formerly Mpack Learning Center) provides high quality assessments, education and training in industrial and facility maintenance that increases employee knowledge, performance and productivity.
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