COLLEGE OF ENVIRONMENTAL DESIGN

ARE 524
Facilities Maintenance Management
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Managing Change
Section 2

Uptime
Strategies for Excellence in
Maintenance Management
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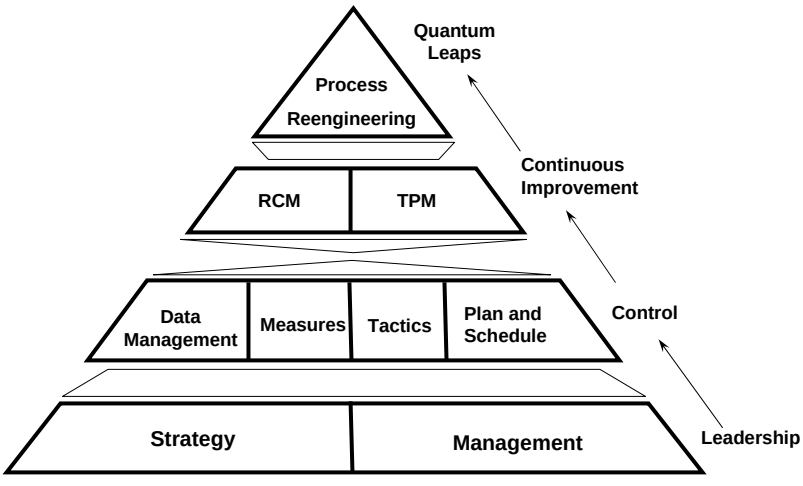

World Class Maintenance

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OUTLINE

- INTRODUCTION
- WHAT, WHY, HOW TO CHANGE?
- ORGANIZING THE MAINTENANCE STRUCTURE
- MULTI SKILLING
- LEARNING, TRAINING, AND DEVELOPMENT
- COMPENSATION AND REWARD

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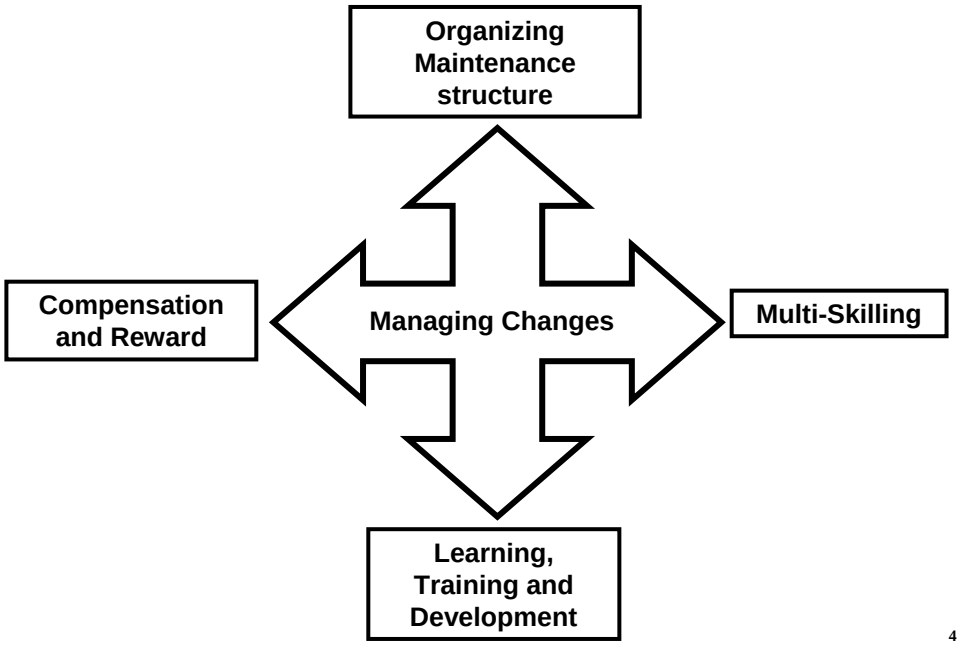

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INTRODUCTION - 1/11

- Change is one thing you always count on. Today, change is faster than ever and unpredictable. Many business are left scrambling uncertain how to catch up.
- Change can be described as a movement from one state to another, through various transitional forms, to a final condition.
- To successful, within an organization, the vision of change must be embraced by every employee. They must understand, accept, and, particularly, internalize the need of change.

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CAHGE IN PAST vs. TODAY- 2/11

- In the past, an outside expert was often brought into an organization to research and design changes. This was followed by an edict from executive management to these ideas into practice. However this approach tend to produce mixed, short-term results.
- Today, in the other hand, an organization must steer its own course in an organized and controlled fashion toward a predetermined goal or vision

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OBJECTIVE & IMPROVEMENT- 3/11

- For plant engineering and maintenance, the main objective is to boost equipment productivity. This can involve many areas:
  - Increasingly complex in every aspect of work
  - Integrated information and data management for employees, fixed assets, cost, performance and activities
  - Advancing process automation and robotics requiring less operations and highly trained technicians
  - Tighter design tolerances for higher quality products and less maintenance intervention
  - Shorter obsolescence cycles as time-to-market for new global economy
  - Larger scale of plant with increasing flexibility
  - Higher investment targets and profit margins in the new global economy
  - More rigorous health and safety standards in all jurisdictions
  - Raised environmental expectation by both regulation and consumers
  - Increased degree of contracting as business stick with their core competencies and contract out the rest
  - Product liability law changes
  - Worker' expectation for self-realization in their jobs

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CHANGE CONSTRAINTS - 4/11

- The most difficult aspect of change is usually convincing those of concerned of the need of change. And that is not easy especially when it means destabilizing the entire organization
- An overall approach to organization and job change is summarized as follow:

1. Establishing the need to change
2. Get all employees involved
3. Set the objectives
4. Define the approach
5. Clarify the boundary
6. Collect all fact and analyze
7. Prepare options and collect solution
8. Develop the plan
9. Carry out the plan
10. Measure and communicate the result

- There are other positive approaches:
  - An independent review of maintenance management
  - An outsider's objectivity and logical insights
  - Customer satisfaction survey

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CHANGE RESISTANCE – 5/11

- People resist change for many reason. Fear is chief among other. Some may see it as implied criticism.
- Employees may not agree with targeted end result, especially if they had little or no input or the new plan appears to be foisted on them from outside
- To understand the progress of change implementation we should compare it with "cycle of loss"

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LOSS CYCLE – 6/11

- The "cycle of loss" was developed to counsel people when they have experienced a major setback such as death, bankruptcy, etc.
- This also applies when a major change occur on our working lives.
- Cycle of human reactions to radical change
  1. Deny the need of change: refuse the idea of contracting out
  2. Then anger of that should happen
  3. Followed by bargaining to cure the symptoms
  4. Depression follows with full realization
  5. Finally, acceptance of new reality

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CHANGE ACHIEVEMENT – 7/11

- Change occur when there is imbalance between the sum of restraining and driving forces.
- Therefore, in order to change, a field analysis study should be conducted
- There are three basic strategies for achieving change
  - Increase the driving forces
  - Decrease the restraining forces
  - A combination of 1 & 2

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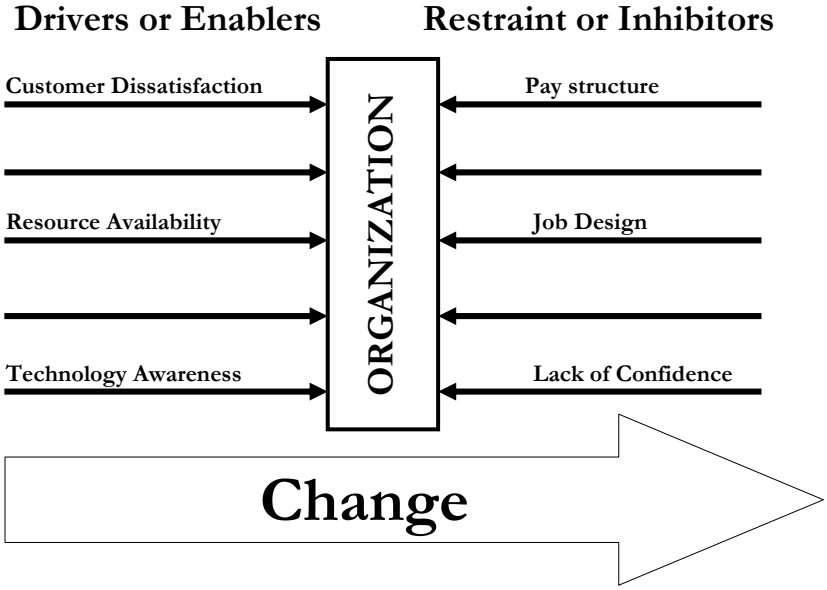
FORCE FIELD ANALYSIS – 8/11



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CHANGE ACHIEVEMENT – 9/11

- **Other strategies for change achievement involves:**
  - **Employee education and training. It will greatly improve the odd for success and as they will participate in the makeover and have time to get use to it**
  - **The benchmarking of an organization structure can also help determine both the direction and rate of change, particularly if the organization is the best in their field.**

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SUCESSFUL CHANGE – 10/11

- **Some noteworthy attributes of change in successful companies are that:**
  - **It was directed strategically**
  - **It was participatory**
  - **The team approach was used**
  - **It was balanced in function**
  - **It was flexible**
  - **It was integrated (not simply interfaced)**
  - **There was excellent communication**

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SUCESSFUL CHANGE 1 11/11

- **The change will be acceptable when:**
  - **It is understood**
  - **People affected have helped to create it**
  - **It has been planned**
  - **People can share its benefits**
  - **It does not threaten security**
  - **It results from previously established principles, rather than personal edict**
  - **It is effectively led**

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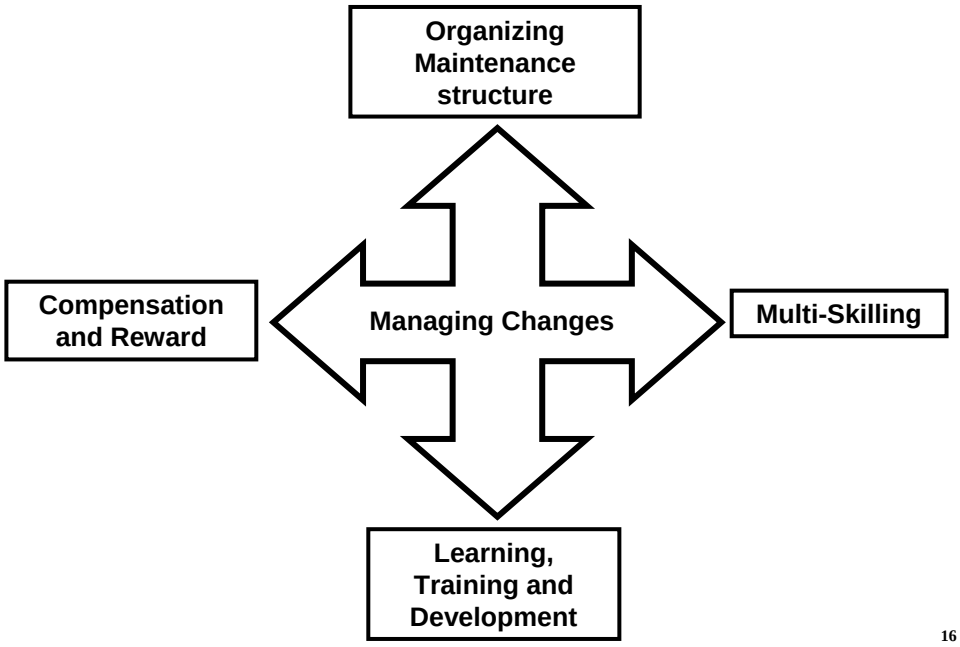

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2. ORGANIZING THE MAINTENANCE STRUCTRE-1/3

- **Maintenance management became an important topic in 1950s and 1960s.**
- **In past, maintenance organization were centralized through maintenance manger, who was responsible for all aspects of plant and facility support such as; mechanical, electrical, repair shops, and planning**
- **All services were dispatched centrally**
- **This concept had two advantages:**
  - **It ensured control over policy, procedure, systems**
  - **It guaranteed the efficient leveling of the workload across the operation**

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ORGANIZING THE MAINTENANCE STRUCTRE – 2/3

- **However the major disadvantages was the inflexibility, which was in many ways:**
  - **Sluggish response time to production request**
  - **Trades peoples' ignorance of specific equipment in the plant**
  - **Customer unawareness of the trades**
  - **Rigidity in approach, procedures, and policies**
  - **High charge out rate to local areas and bureaucratic processes**
  - **Customer dissatisfaction over allocation of resources**
  - **Strict demarcation among the trades, and between maintenance and production**
  - **Focus on efficiency, not effectiveness**

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ORGANIZING THE MAINTENANCE STRUCTRE – 3/3

- Some crucial questions remain. Does central control always lead to inflexibility? How are risk management and maintenance handled consistently from department to department under full decentralization?
- What's clear is that a dogmatic approach does little to balance unique technical, systems and behavioral complexities
- A better approach is to revise the maintenance strategy. It is not to lose sight of enterprise business plan and the environment in which the maintenance function must perform
- Usually the best solution to organization restructuring for maintenance is hybrid of centralized and local area functions

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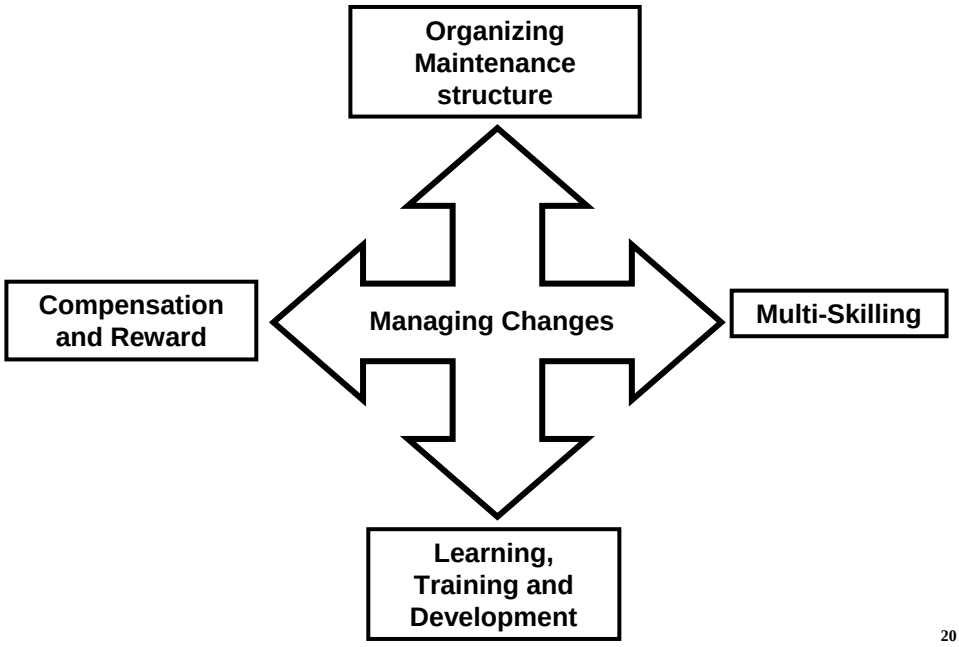

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3. MULTI SKILLING -1/4

- As decentralization and flexibility took hold, it became essential to improve labor skill planning and scheduling.
- Managers had to offset the inevitable duplications in a decentralized system with higher asset performance and labor productivity
- One option was to train workers in multiple skills
- There were challenged at the time multi skill was introduced:
  - Multi disputes and communication difficulties,
  - Workload leveling,
  - Demands for job enrichment, and
  - General management career path planning

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MULTI SKILLING – 2/4

- Multi-skilling means providing employees with all the necessary to their tasks effectively, and its aim is increasing the flexibility
- If multi-skilling is approached simply to slash costs rather than improve productivity, its most significant long-term benefits will be lost
- Planning of multi-skilling should center around a training needs and task analysis.
- This information can be found in work order histories, engineering studies, and maintenance manuals, or through employee questionnaires and surveys

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MULTI SKILLING – 3/4

No.	Trade Description	Blue Print reading	Request ion	Programming PLC	Vibration Analysis	Pneumatics	Hydraulics	Drilling	Shearing/Sawing	Measuring	Welding	Rigging	Framing	Trouble shooting	Lubrication	Balancing	Alignment	Thermal Cutting	Bricklaying
1	Mechanic	✓	✓	✓	✓		✓	✓	✓					✓	✓	✓	✓		
2	Electrician	✓	✓	✓					✓					✓					
3	Instrumentation technician	✓	✓	✓		✓			✓					✓					
3	CNC automatic machinist	✓	✓	✓					✓				✓	✓	✓				
4	Pipe fitter	✓	✓			✓			✓		✓								
5	Welder	✓	✓						✓	✓								✓	
6	Rigger		✓								✓		✓						
7	Stationary engineer		✓										✓	✓	✓			✓	
8	Machinist	✓	✓		✓	✓	✓	✓	✓						✓			✓	
9	Millwright	✓	✓				✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	
10	Mason	✓	✓						✓										
11	Carpenter	✓	✓				✓		✓			✓							✓
12	Painter		✓																
13	Mobile equipment diver		✓										✓						

- **Relation of between various trades and tasks performed**

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MULTI SKILLING 4/4

- **It was founded that many basic education is necessary before skill training can start, such as: literacy's, general information in maintenance management, modern concept, and basic computer skills.**
- **There are long-term benefits of multi-skilling**
  - **Increased flexibility in scheduling workers**
  - **Shorter response time**
  - **Reduced need for supervision**
  - **Greater labor and assets productivity**
  - **Higher moral among workers**
  - **Improved scheduling, communication, and integration**
  - **More stable employment**
  - **Greater job satisfaction**

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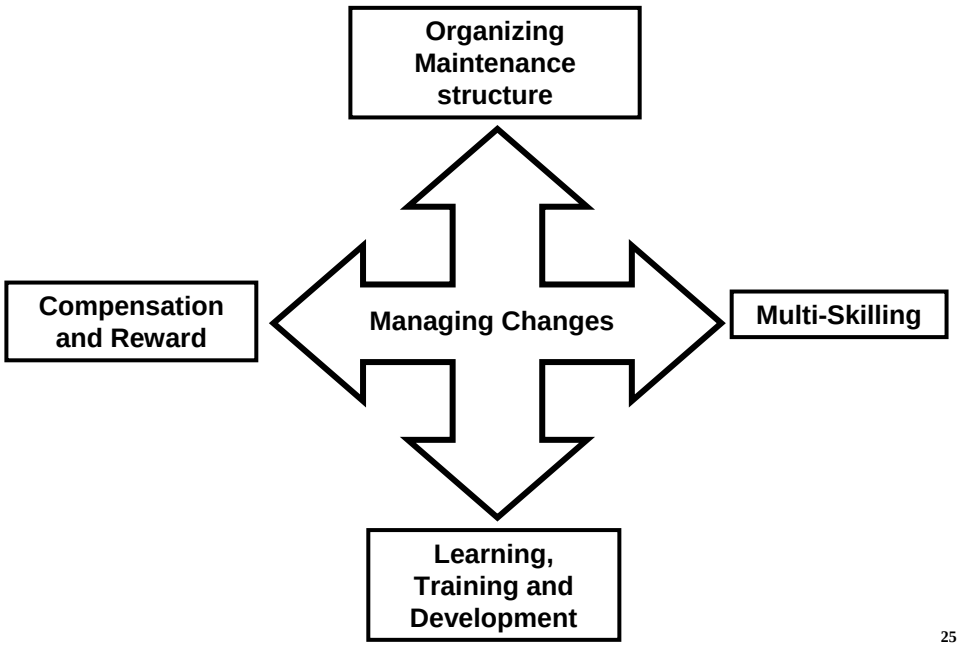

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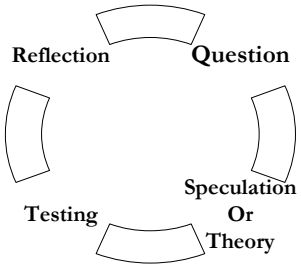
LEARNING, TRAINING, AND DEVELOPMENT – 1/7

- Learning is an attitude, an approach to life. Those who value knowledge don't hesitate to investigate if they suspect there is a more productive way of completing a task
- Learning process can be divided into four parts " The age of Unreason"



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TRAINING & EDUACTION STRATEGY – 2/7

- **Learning strategy should have:**
  - **A clear objectives**
  - **A review of the training needs**
  - **An understanding of the unique work culture**
  - **An implementation plan addressing th training needs and work culture**
  - **The associated costs and benefits**
  - **Continual assessments of whether the objectives are being met**
- **Learning can range from basic literacy to the latest methods of managing technical people**

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TRAINING REQUIREMENTS – 3/7

Administration
Personnel Management
Team Leadership
Preventive Maintenance
Emergencies
Troubleshooting
Plant and Instrument Drawings

Mechanical		Electrical	
	Condition-Based Monitoring		Electronics
	Pneumatics		3 Phase AC
	hydraulics		Controls
	Drive Components		Single Phase AC
	Lubrication		DC Circuits
	Precision Measurement		Electrical Measurements

Work Orders and Requisitions
Equipment Elements
Basic Hand Tools

Scope of Training Requirements

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EDUCATION & TRAINING – 4/7

- The objective of the education is to expand knowledge of a topic, to bring an uniformed individual through stages of awareness to understanding
- The aim of training is to upgrade a person's skills to do the job effectively
- To match education and training needs; tasks should be matched with the skilled required to execute them

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EDUCATION & TRAINING – 5/7

- Taking a bottom-up approach; basing plant and equipment maintenance requirement on the manufacturer's recommendations and equipment history records, can be overwhelming
- Instead, top-down approach; reviewing plant and equipment performance against requirements or expectations, more likely to see thorny areas
- Many of these problems are caused by gabs in knowledge or skills

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EDUCATION & TRAINING – 6/7

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- **When planning a training program, it should be thought not only to *what* should be include, but also to:**
  - ***Who*- to optimize the costs and impact on the available workforce**
  - **W*hen*-consider plant schedules, cultural issues, after hours**
  - ***Where*- on site, off-site, at home, out –of-town**
  - ***By whom*- community college, supervisors, vendors, consultants**
  - ***How*- mix of classroom and on-the-job, lecture, audio visual, home study**
  - ***How much*- standards, evaluations and certifications**

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EDUCATION & TRAINING – 7/7

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- **Managing others is as essential a skill as expertise in trades or crafts**
- **Too often, though, no thoughts is given training to people how to manage**
- **A typical supervisor, who may is promoted for being technically adept and a team player, but may not have inherent ability to manage**
- **In other hand, a maintenance manger with no understanding of leadership, budgeting, administration can be a liability**
- **For people to learn to handle change, they need education and encouragement. Sharing positive results is the best for ensuring more of the same**

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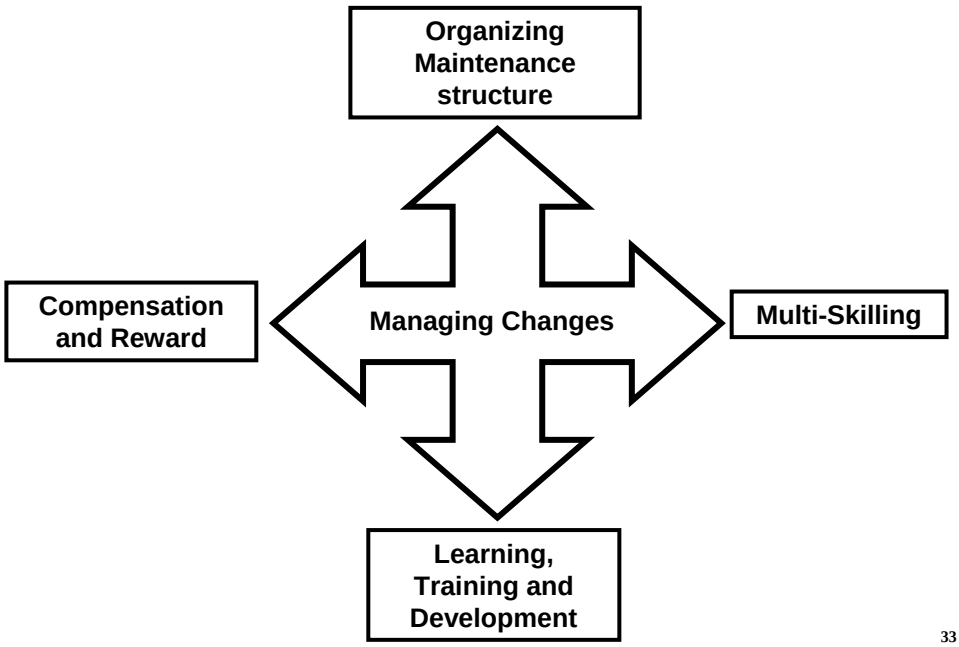

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4. COMPENSATION AND REWARDS – 1/5

- The best way to attract qualified enthusiastic technical employee, is to reward them generously for their extra effort.
- The prospect of a major commitment to education and training will pale without a direct payoff, even though increased skills can't bring long-term rewards
- Compensation program should depend on organization's overall objectives as well as maintenance strategy
- Compensation divides into four main categories: base pay, incentive pay, benefits, and perquisties

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4. COMPENSATION AND REWARDS – 2/5

1. ***Base pay*** **– In any compensation system, base pay must be competitive and guaranteed. It normally related to an employee's position, grade, or seniority, and tasks and duties required in the job description. But in case of multi-skilling, it should be based on the knowledge or skill level demonstrated by employee**
2. ***Incentive*** **– Can be designed around either individuals or groups**

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4. COMPENSATION AND REWARDS – 3/5

3. ***Benefits*** **– Traditionally, benefits have encompassed both the social safety net and basic life and disability insurance**
4. ***Perquisites*** **– Perks are popular when the economy is expanding and competition for highly qualified employees is keen. In maintenance management, the most common perks subsidized personal work tools and equipment, education leave, and financial assistance**

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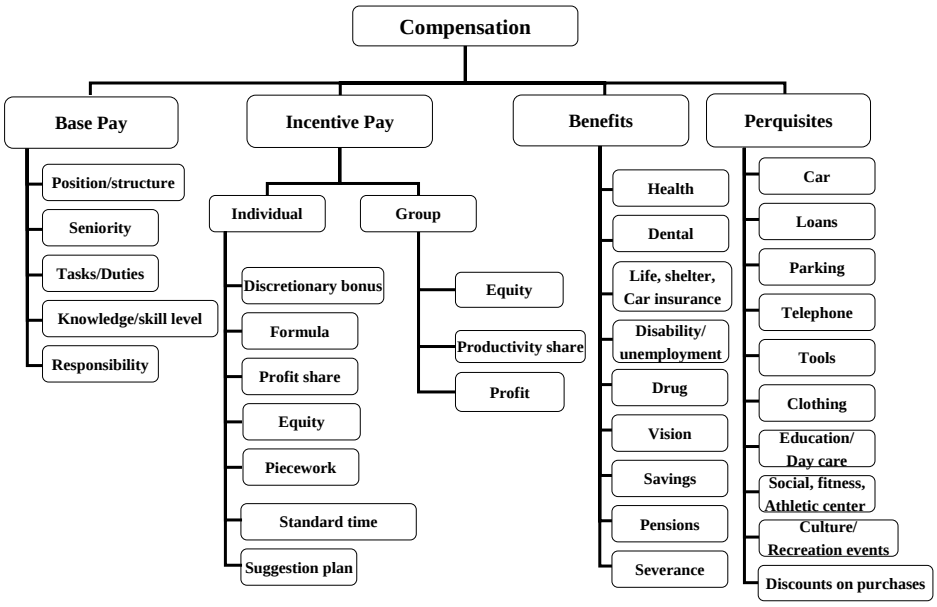
4. COMPENSATION AND REWARDS – 4/5



Compensation Categories

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4. COMPENSATION AND REWARDS – 5/5

- Nonmonetary rewards are another way, besides base and incentive pay, to recognize individuals and groups for a job well done.
- There is usually no set pattern for perks, which vary greatly depending on organization
- Award can range from strict trade limits to demonstrated knowledge and skill
- It also shows that management is sharing company's financial success with employees and recognizing their career aspirations

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Thank You

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