

Preparing Technical Specialists for Nuclear Manager / Leadership Responsibilities

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The Abdus Salam
**International Centre
for Theoretical Physics**



IAEA

60 Years

Atoms for Peace and Development

1957-2017



Terminal Objective

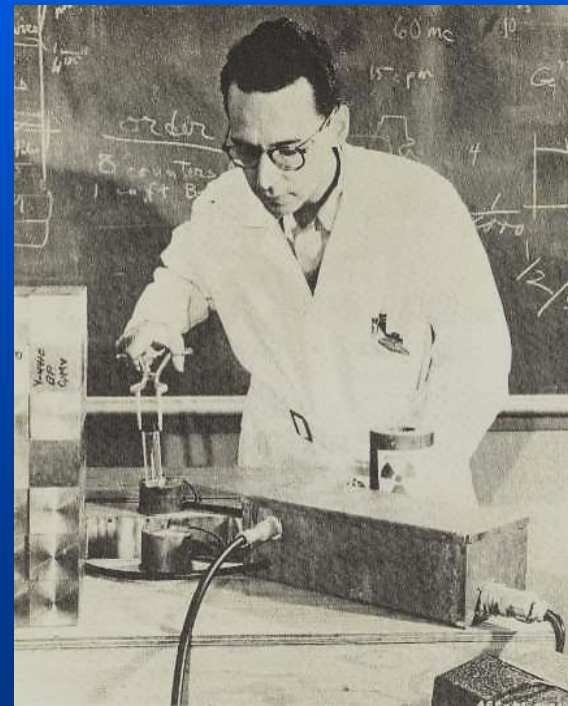
- By participating in this course, and applying this information (e.g., slides, handouts) in your work environment, you will be **prepared** to become a visionary leader and efficient manager.

Learning Objectives

- LO1 - Recognizing the need for a class on management, and ultimately, leadership.
- LO2 – The study of management, organizational culture and climate.
- LO3 - When you are finally in charge! The manager / leader mystique of success.
- LO4 - Ideas into performance.
- LO5 - Nuclear managerial and leadership career advice.
- LO6 – Additional handouts and slides.

LO1 - Recognizing the need for a class on management, and ultimately, leadership.

- Training and career development activities typically focus on acquiring additional work experience and enhancing technical problem-solving skills.
 - Manager of data.
 - Provide a technical specialty.
 - Report to a manager.
 - Subject Matter Expert (SME).



From SME to Nuclear Manager

- As Subject Matter Experts gain additional experience, they may be required to accept and adapt to the role of a Nuclear Manager.
 - Manager of people.
 - Influence direct-report employees inside your organization and company.
 - The indirect capability to influence other employees outside of your organization and company.

“Anyone can steer the ship when the sea is calm.”

Publilius Syrus

Question: How and when did you discover that you were a manager?



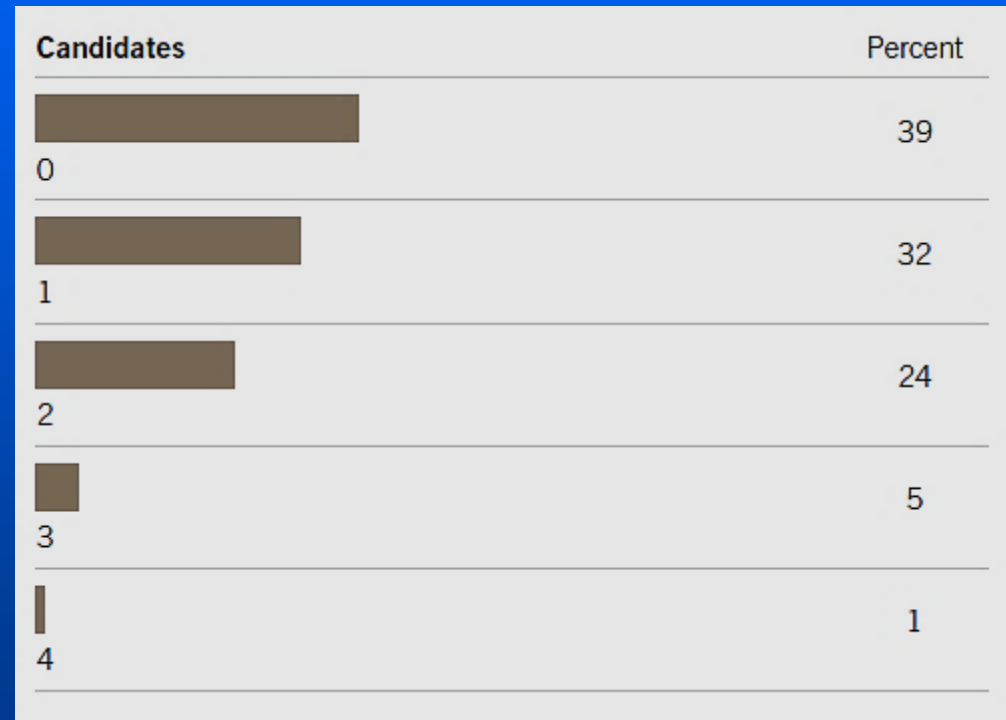
How do you train to become a Nuclear Manager?

- Unless a company has a specific Nuclear Manager-trainee class or succession program to develop talent from within, styles are learned “on the job.”
- Good and bad styles are obtained and nurtured by watching and working under other good and bad managers.

Succession planning

- How many candidates from the internal talent pool are “ready now” to immediately assume the CEO position (i.e., you could name them tomorrow if required)?

About 90 days
are required to
evaluate and
name a successor.



Source: 2014 *Report on Senior Executive Succession Planning and Talent Development*, Stanford Graduate School of Business, Stanford, California.

LO2 – The study of management, organizational culture and climate

Many highly intelligent and ambitious men are not learning from either their formal education or their own experience what they most want to know to build successful careers in management. Their failure is due, in part, to the fact that many crucial managerial tasks are not taught in management education programs (p. 88).

1971

1977

The graduates lacked a practical, disciplined understanding of themselves and their environment . . . they didn't know how to use knowledge effectively. In short, they weren't educated (p. 48).

The business school graduate is adequately trained to get the first job but often had difficulty holding it and advancing. To be blunt, the typical business school curriculum fails to prepare students properly (p. 49).

1982

K.S. Cameron, D.A. Whetten, "A Model for Teaching Management Skills", *EXCHANGE: The Organizational Behavior Teaching Journal*, VIII(2), 21-27, 1983.

Defining characteristics of effective managers

Table 1

**Characteristics of Effective Managers:
Management Skill Topics**

- | | |
|---|---|
| <p>1. Self Awareness</p> <ul style="list-style-type: none">• personality• values• needs• cognitive style | <p>6. Effective Delegation and Joint Decision Making</p> <ul style="list-style-type: none">• assigning tasks• evaluating performance• autonomous vs. joint decision making |
| <p>2. Managing Personal Stress</p> <ul style="list-style-type: none">• time management• goals• activity balance | <p>7. Gaining Power and Influence</p> <ul style="list-style-type: none">• sources of power• converting power to influence• beneficial use, not abuse, of power |
| <p>3. Creative Problem Solving</p> <ul style="list-style-type: none">• divergent thinking• conceptual blocks• redefining problems | <p>8. Managing Conflict</p> <ul style="list-style-type: none">• sources of conflict• assertiveness & sensitivity• handling criticism |
| <p>4. Establishing Supportive Communication</p> <ul style="list-style-type: none">• listening• empathy• counseling | <p>9. Improving Group Decision Making</p> <ul style="list-style-type: none">• chairing meetings• avoiding pitfalls of bad meetings• making effective presentations |
| <p>5. Improving Employee Performance Motivating Others</p> <ul style="list-style-type: none">• needs/expectations• rewards• timing | |



K.S. Cameron, D.A. Whetten, "A Model for Teaching Management Skills", *EXCHANGE: The Organizational Behavior Teaching Journal*, VIII(2), 21-27, 1983.

Defining Organizational vs. Safety Culture (and Climate)

	Organizational / Safety <i>Culture</i>	Organizational / Safety <i>Climate</i>
Type of Information	Qualitative / Perception	Quantitative / Numbers
How information is administration and collected	Administered through <u>observations and interviews</u> reporting beliefs, values and <u>patterns</u> about the <u>organization</u>	Self-administered <u>questionnaires</u> reporting characteristics of behavior, <u>attitudes</u>, and/or job <u>satisfaction</u>
Company Level	Reflects senior management	Reflects middle management and shop-floor employees

- Organizational / Safety Culture - A construct of underlying attitudes and practices contributing to “The way we do things around here”.
- A safety culture (resulting perceptions and actions) expresses itself through a safety climate (surveys).

Theories or Models Measuring Safety Culture and Safety Climate

- Heinrich's Domino Theory (ca. 1930s) - A social environment conducive to accidents was the first of five dominos to fall in an accident sequence: 1. social environment; 2. worker fault; 3. unsafe act + hazard; 4. accident; and 5. injury.
- Turner's theory of man-made disaster (1978)
- Geller's total safety culture model (1994)
- Reason's 'Swiss Cheese' model (1997)
- Theory of high reliability organization (HRO) (2001)
- Flin's model of safety climate and injury outcomes for healthcare industry (2007)
- Source: Vu and De Cieri, *Conceptual Foundations of Safety Culture and Safety Climate Measurement: A Snapshot Review*, Report#: 060-1215-R04, December 3, 2015.

“Nuclear Safety Culture”

- Traced to the Chernobyl-4 post-accident review in 1986.
- “The vital conclusion drawn is the importance of placing complete authority and responsibility for the safety of the plant on a senior member of the operational staff of the plant. Formal procedures properly reviewed and approved must be supplemented by the creation and maintenance of a ‘nuclear safety culture’.”

The International Nuclear Safety Advisory Group (INSAG)

Organizational vs. Safety Culture (and Climate)

- Requirement (R)1: Achieving the fundamental safety objective
- R2: Demonstration of leadership for safety by managers
- R3: Responsibility of senior management for the management system
- R4: Goals, strategies, plans and objectives
- R5: Interaction with interested parties
- R6: Integration of the management system
- R7: Application of the graded approach to the management system
- R8: Documentation of the management system

IAEA Safety Standards

for protecting people and the environment

Leadership and
Management for Safety

General Safety Requirements
No. GSR Part 2



Published in
2016

Organizational vs. Safety Culture (and Climate)

- R9: Provision of resources
- R10: Management of processes and activities
- R11: Management of the supply chain
- R12: Fostering a culture for safety
- R13: Measurement, assessment and improvement of the management system
- R14: Measurement, assessment and improvement of leadership for safety and of safety culture

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Case Study - The Longford accident – 09/25/98

- The Longford Gas Production and Processing Plant is located in Victoria, Australia.
- Hot, lean oil (230°C) was reintroduced into a chilled vessel (-48°C).
- Temperature difference caused the vessel to fracture.
- A rupture in the vessel released hydrocarbon vapor.
- The vapor ignited by the oil heaters caused an explosion and fire.

When an accident happens, it is too late!



Longford accident three-year court case

- Two fatalities and eight employees injured.
- Two days were needed to extinguish the fires.
- Gas supplies to over one million homes and businesses in Victoria were cut off for ~3 weeks.
- **Charges – Management failed to:**
 - Conduct adequate training, hazard analysis and risk assessment.
 - Provide means to verify the equipment operated at temperatures within design specifications.
 - Operate the plant using adequate procedures.

An AcciMap of the Esso Australia Gas Plant Explosion

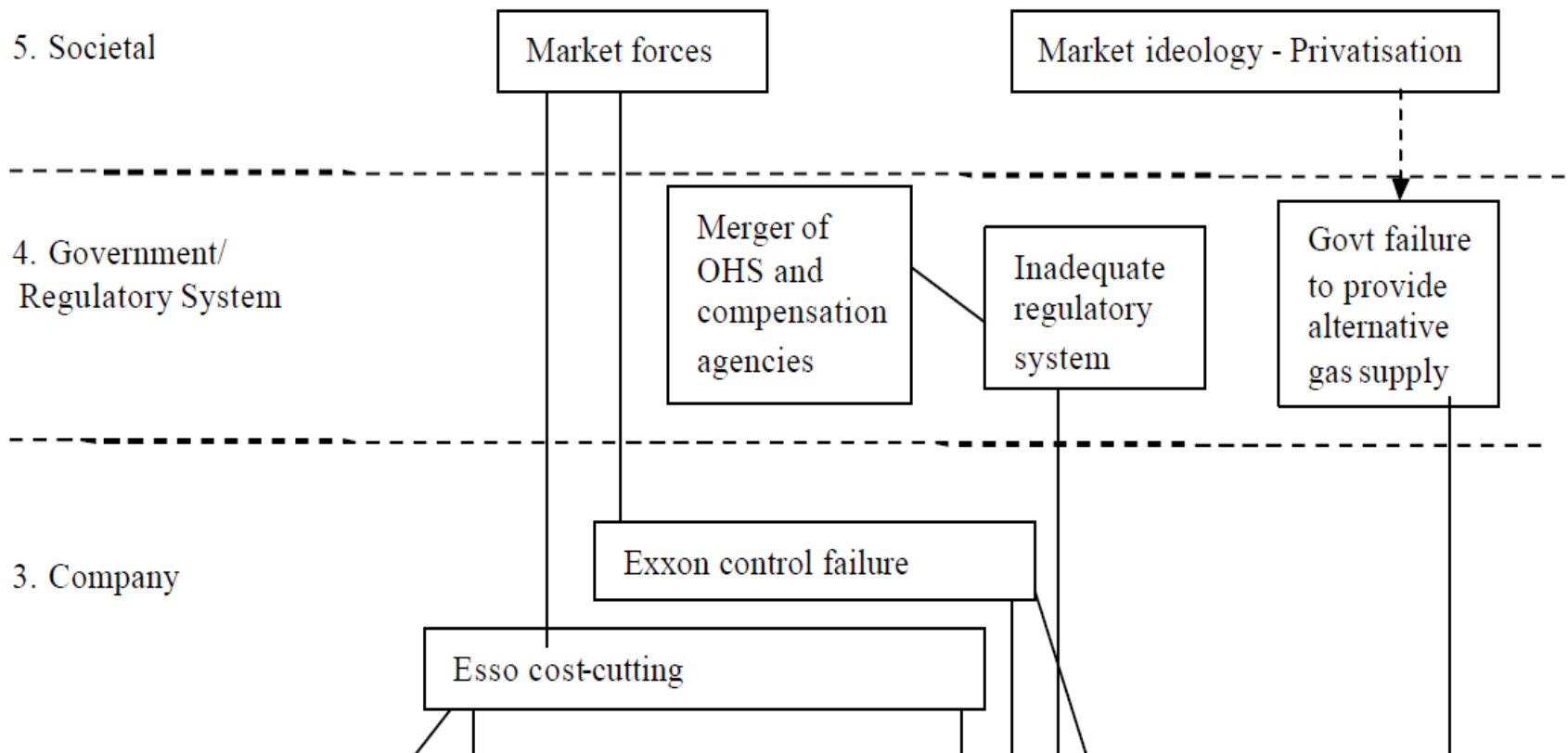
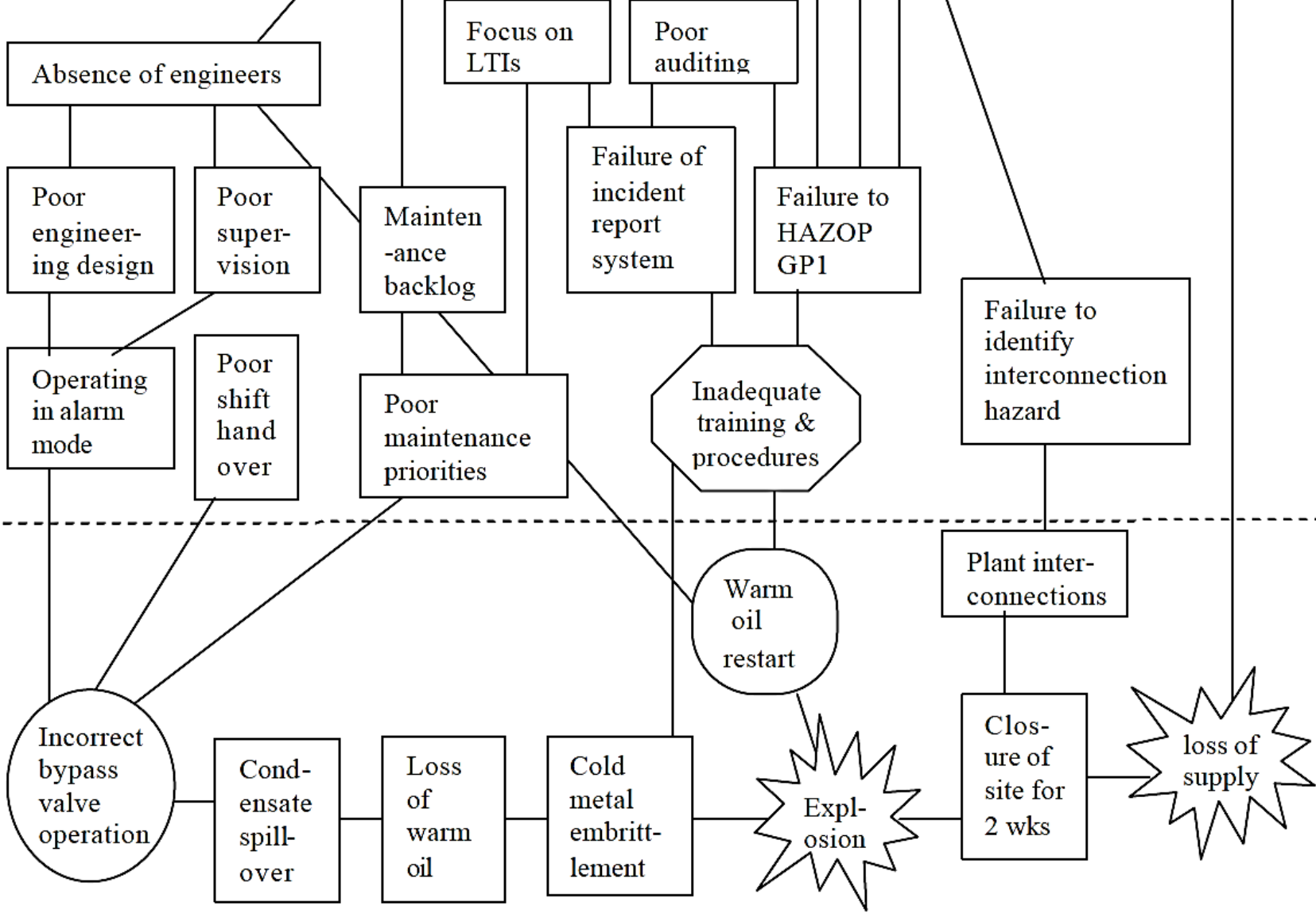


Figure 1 - AcciMap of Esso Gas Plant Accident

2. Organisational



1. Physical accident sequence

Keywords of a bad day

- Failure – 5
- Poor – 5
- Inadequate – 2
- Loss – 2
- Absence – 1
- Alarms – 1
- Backlog – 1
- Incorrect – 1
- Spillover / Embrittlement – 1

Human (management) and organizational (culture / climate) accident contributors

Combination of inadequate risk analysis and poor job planning are primary contributors to accidents.

- Pursue production or schedule goals over safety.
- Changed condition or unplanned deviation.

The Four Basic Questions

Q1: How do you do this work?

- Hazards and mitigating controls – Engineering controls, administrative controls and personal protective equipment.
- Education or training to operate specialized equipment.

Human (management) and organizational (culture / climate) accident contributors

Q2: How do you know you are doing this work correctly?

- Written procedures provide detail to perform work, mitigate hazards, and provide emergency response.

Q3: How do you know the outcome is free of defects?

- Verification and validation of an expected result.
- Neutralized liquid ready for solidification.
- Regulatory report in proper format.

Q4: What do you do when you discover a deviation?

- Quality assurance corrective action process.

LO3 - When you are finally in charge! The manager / leader mystique of success

- **Manager**: A person responsible for controlling or administering all or part of a company or similar organization. (**Not necessarily a Leader**).
- **Leader**: The person who leads or commands a group, organization, or country. (**Could be a manager**).
- **Expert**: Someone called in who lives >60 km away from the work site.
- Management and leadership are **two distinctive and complementary systems** of action.
- Both are necessary for success in an increasingly complex and changing business environment.

Reality of managerial life

- Managers are busy.
 - A typical day is made up of hundreds of brief incidents or episodes.
- Work is fragmented.
 - Little time is devoted to any single activity.
- Activities are varied.
 - Paperwork, phone calls, scheduled and unscheduled meetings and inspections.
- Verbal direction.
 - A manager's direction and exchange is primarily through verbal communication.

Communication
means different
things...



*Unfortunately, animals sometimes lack the
necessary skills to communicate with each other.*

...to
different
people.

Paper
Exercise

Managing vs. Leadership - Differences

- Management is about coping with process and complexity.
- The here and now.
- Based on practices and procedures in response to one of the most significant developments of the twentieth century: the emergence of large organizations.
- Without good management, complex enterprises tend to become chaotic in ways that threaten their very existence.
- Good management brings a degree of order and consistency.

Managing vs. Leadership - Differences

- Leadership is about coping with change.
- *Listen first, speak last.*

“What are we doing (Managing) vs. where are we going (Leading).”

J. Hylko

Managing vs. Leadership - Examples

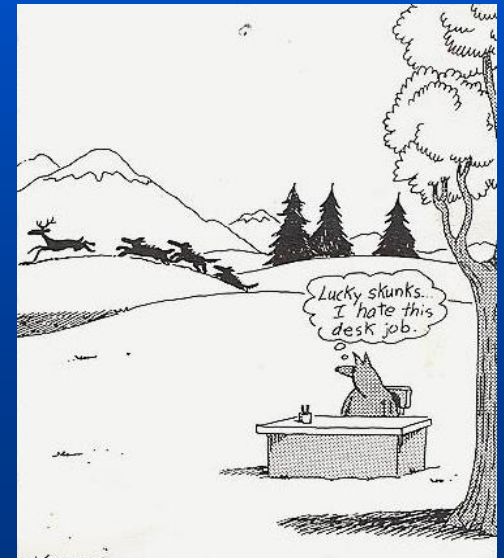
- 1. Planning and budgeting vs. setting direction.
- Management's function is predictability, and orderly results.
- Leadership's function is to produce change.
- Observe patterns and relationships.
- 2. Organizing and staffing vs. aligning people.
- Managers look for the right fit between people and skills (jobs); systems ensure that plans are implemented precisely and efficiently.
- Leaders look for the right fit between people and the vision; communication can yield success or failure.

Managing vs. Leadership - Examples

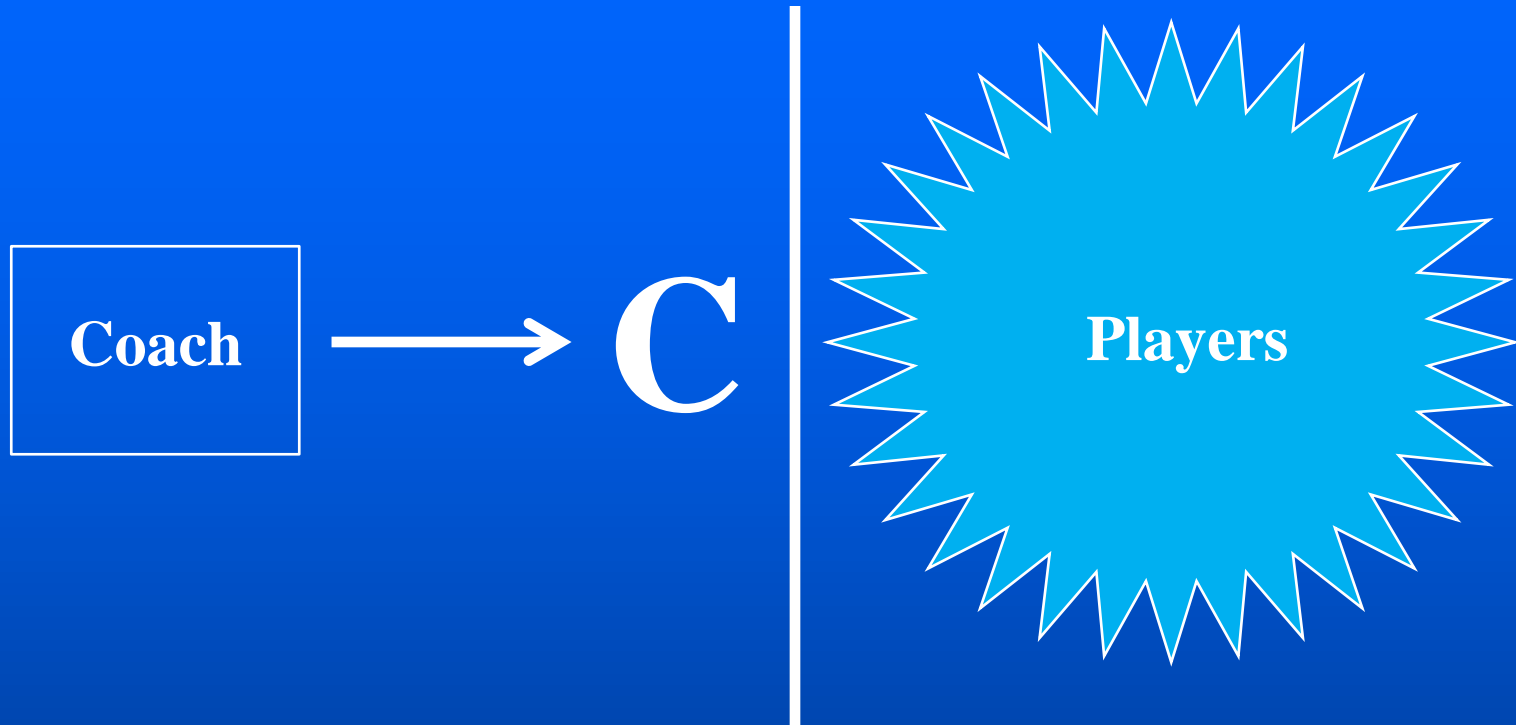
- 3. Controlling activities and solving problems vs. motivating and inspiring.
- Management strives to make it easy for people to complete routine jobs day after day.
- Since high energy is essential to overcoming barriers to change, leaders attempt to instill a sense of belonging, idealism, and attitude.

Summary:

- Management is quantitative.
- Leadership is qualitative.

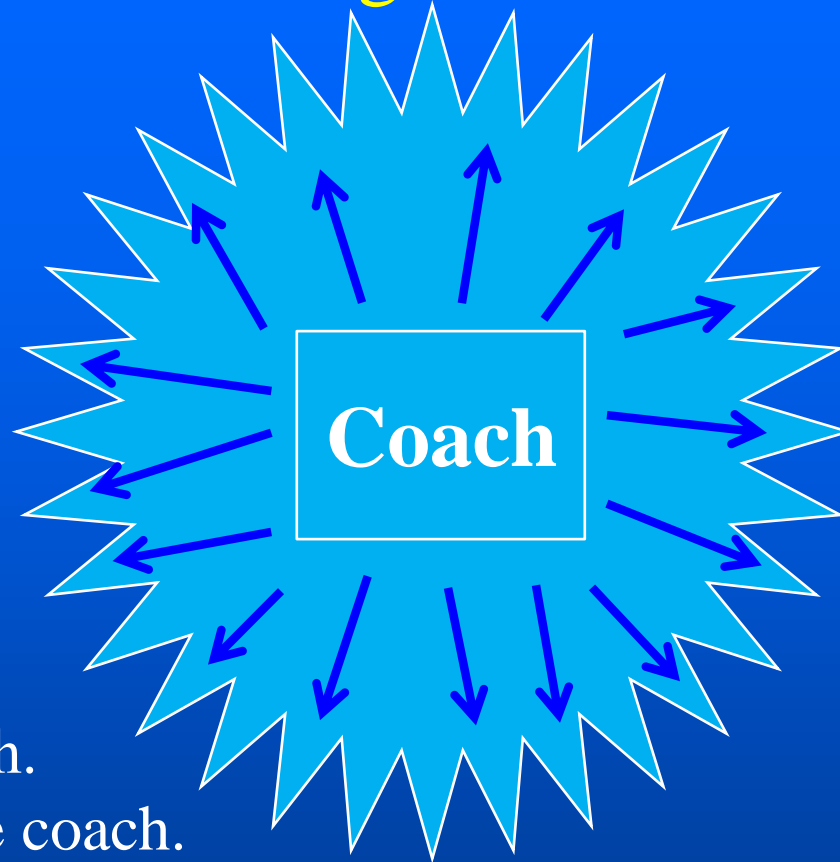


Creating Leaders



- Captain (C) serves as a barrier between the coach and players (i.e., shield for the team).
- Forces the players to trust the Captain and each other.
- Captain serves as a *de facto* coach during the game.
- Players are less dependent on the coach in crisis situations.

Creating Leaders



- A player's coach.
- Players trust the coach.
- Captain and players may become too dependent on the coach.
- Assistant coaches monitor that players are treated evenly and fairly.
- Both cases - A strong bench determines a championship.
- Both cases - Your programme has a three-year longevity.

Your Department

- As the manager (or coach):
 - You maintain oversight of the programme
- Direct-reports implement the programme:
 - You have developed the tools.
 - You have issued the tools.
 - You have delegated your authority.

Reason: Your direct reports use these tools and delegated authority to perform the scope of work and implement your game plan.

You must delegate to succeed!

- Delegation is the process of assigning various degrees of decision-making authority to direct reports.
- Although authority is passed along to direct reports, ultimate responsibility cannot be passed along.
 - The coach is fired after a losing season or losing key rivalry games.
- Therefore, delegation becomes the **sharing of authority**, not the abdication of responsibility.
- Before you can delegate, you must **communicate**.

You must delegate to succeed!

- **Degrees of delegation**

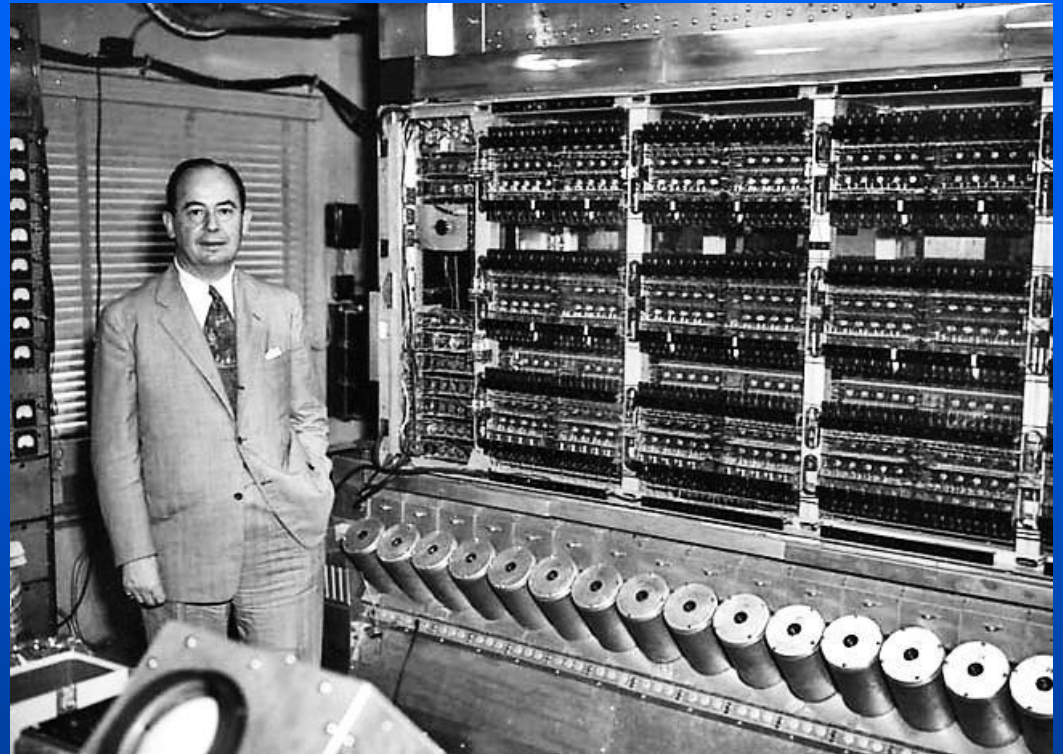
- Low: Investigate and report back. Manager uses facts provided by direct reports to identify decision alternatives, makes the decision and takes action.
- Moderate: Investigate and advise on action planned. Supervisor approves or disapproves recommended course of action provided by direct report.
- High: Investigate and take action. Direct report pursues course of action.

You are managing strategy, not effort.

LO4 - Ideas into performance

“There’s no sense in being precise when you don’t even know what you’re talking about.”

John von Neumann
1903 - 1957



Markers and Metrics - How do we know the program is working?

- Quantitative – Numbers and Rates.
 - Accumulated over 650,000 safe work hours.
 - Downward trend of accident and injury rates.
- Quantitative - Open corrective actions.
 - How long do they typically stay open?
 - Days, weeks, months...

“If one takes care of the means, the end will take care of itself.”

Ghandi

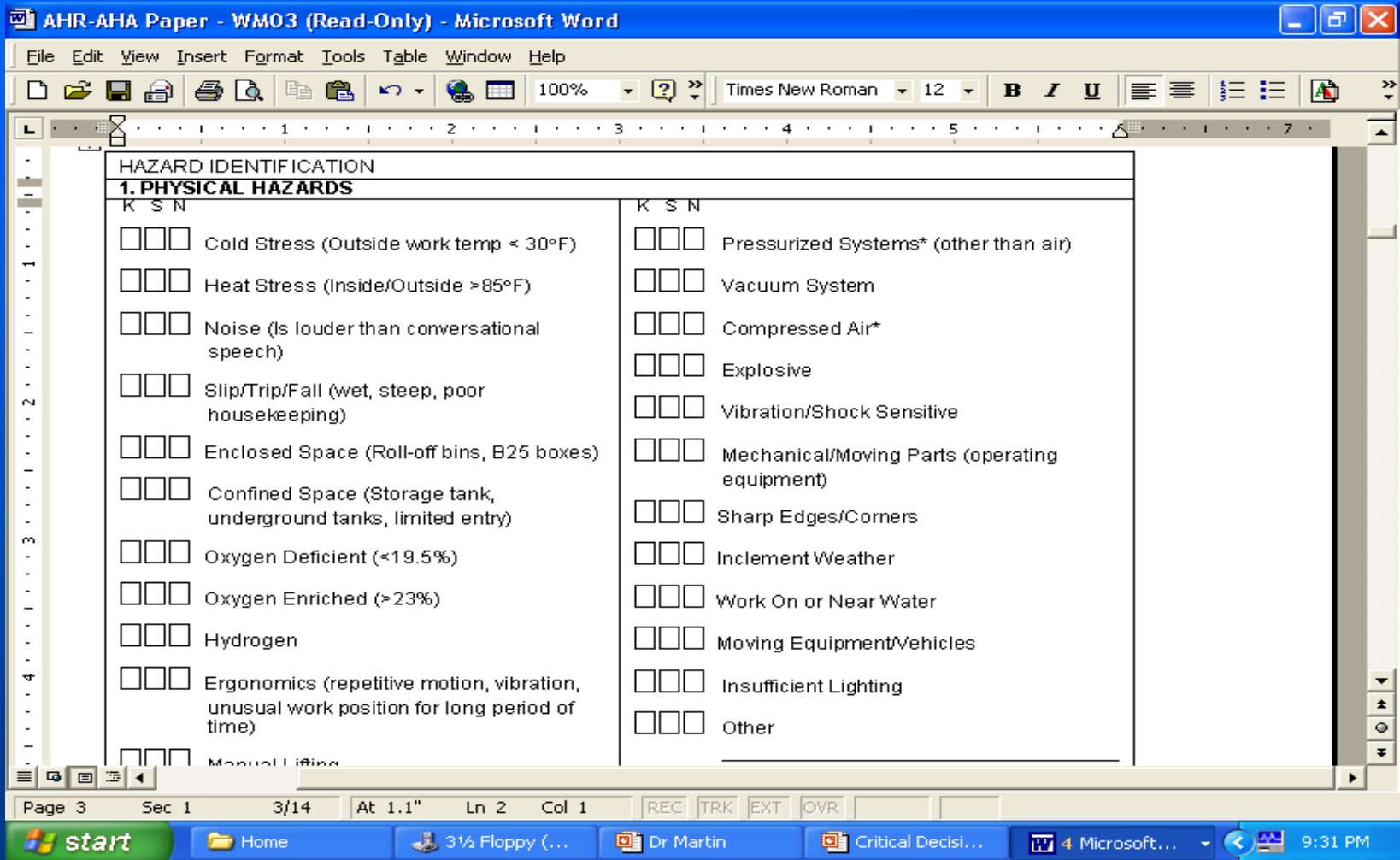
“If you are doing things correctly, the numbers take care of themselves.”

J.M. Hylko

Markers and Metrics - How do we know the program is working?

- Qualitative - Self assessments (The real reason for management!).
 - Are employees wearing gloves when handling abrasive materials / items?
- Qualitative / Quantitative - Does a safety culture and questioning attitude exist among employees?
 - Activity Hazard Reviews (AHRs) / Activity Hazard Analyses (AHAs)
 - Pre-job and post-job briefings
 - Daily closeout meetings
 - STOP work suggestions

Analyze Hazards – One of the Four Basic Questions



Success stories - Daily

- A management representative leads the 6:00 am Plan of the Day – every morning / off hours.
 - Standard information
 - Safety topic
 - Weather
 - Sports scores of local teams
 - Identify and resolve safety issues in the field
 - Discuss project details, metrics, trends
 - Host other departments (e.g., Human Resources)

Success stories - Weekly

- Monday – Scope of work / Plan of the week
- Tuesday – Safety
- Wednesday – Quality
- Thursday – Schedule and budget
- Friday – One year ago today...
- Ramp up Monday, wind down / loose ends Friday

LO5 - Nuclear managerial and leadership career advice

- Good performance is still the basic foundation of success.
- How you communicate in your department and company will influence your upward mobility.
- Be active in decision-making events - pure effort is not always rewarded.
- Become a complementary employee by having different skills than your managers.
- PUBLISH YOUR WORK.

“Do you want 5 things half done or 10 things half done?”

J.M. Hylko

Practical career advice

- Do not expect your responsibilities to be defined by formal, narrow job descriptions.
 - “Responsible for other duties as assigned.”
 - Collect your “Assignment / Project Completion List” during the first 6 months, then compare it to your job description.
- Establish cooperation with other departments within your organization (e.g., Quality Assurance, Human Resources, Records Management).

Looking either up or down the career ladder...

- Your career within your organization will be determined by the competency of your immediate supervisor.
- Communication skills eventually overshadow technical skills.
- Your direct reports are looking to you to advance their careers.

“Your direct reports will not accept you until they have a reason.”

J.M. Hylko

Recognizing Your Strengths and Weaknesses

- Van Cliburn (1934 – 2013).
- An American pianist who achieved worldwide recognition in 1958, at the age of 23 for winning the first quadrennial International Tchaikovsky Piano Competition in Moscow.
- His mother, Rildia Bee Cliburn had studied under Arthur Friedheim (1859 – 1932), a pupil of Franz Liszt (1811 – 1886) a 19th-century Hungarian composer.



Recognizing Your Strengths and Weaknesses

- John Williams (b. 1932).
- While at Juilliard he heard players like Van Cliburn.
- **“If that's the competition, I think I'd better be a composer!”**
- 49 Academy Award nominations.
- Won 5 times.
- Conductor - Boston Pops, 1980 – 1993.



Learning Objectives

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Star of Success

Communicate, communicate,
communicate.

Maintain adequate
resources to achieve
safety, compliance and
mission.

Prioritize responsibilities.

Train new employees so
existing employees can
advance in their careers.

Retain experienced employees
to reduce loss of
“corporate memory”.

Terminal Objective

- By participating in this course, and applying this information (e.g., slides, handouts) in your work environment, you will be prepared to become a visionary leader and efficient manager.

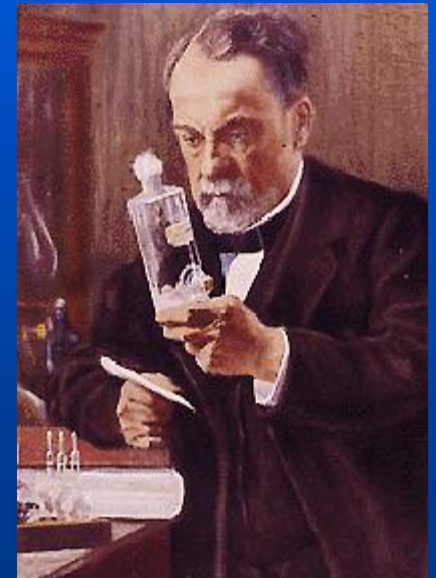
“In the fields of observation, chance favors only the prepared mind.”

Louis Pasteur

27 December 1822 – 28 September 1895

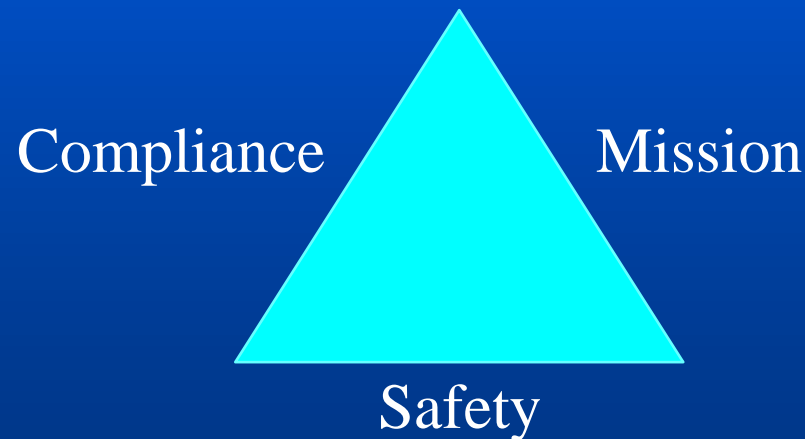
French microbiologist, chemist, pioneer of the "Germ theory of disease", and inventor of the process of Pasteurization.

Lecture, University of Lille - 7 December 1854



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Additional slides

References:

POWER article and white paper: J. Hylko, Safety Culture: A Common Construct Requiring Commitment from the Board Room to the Shop Floor, <http://www.powermag.com/safety-culture-a-common-construct-requiring-commitment-from-the-board-room-to-the-shop-floor/>; June 1, 2017.

Characteristics of a positive safety culture

- Leaders demonstrate a commitment to safety in their decisions and behaviors
 - Commonly seen on the shop floor.
 - Are errors considered as negative to the business, or as learning opportunities?
- Problem identification and resolution
 - Issues are promptly identified, evaluated, and corrected commensurate with their significance.
- Environment for raising concerns
 - A safety conscious work environment exists where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.

Source: NRC Safety Culture website (nrc.gov/about-nrc/safety-culture.html)

Characteristics of a positive safety culture

- A defined organization
 - Defined short-term and long-term objectives.
 - Skills to accomplish objectives.
 - Internal and external communication.
- Proper alignment and allocation of resources in proportion to needs
 - Organization charts.
 - Independence of Safety and Quality Assurance.

Characteristics of a positive safety culture

- Defined job positions and assignments
 - Establishing performance standards (e.g., performance-based indicators) instead of a moving target.
 - Understanding the assignment product or output, and how this supports the department and company.
- The responsibility that each employee possesses in executing their jobs
 - Dependency on each other.
 - When employees are empowered, they work to achieve success instead of working to avoid failure.
 - What happens when no one is looking?

Incorporating lessons learned from other industry case studies (Longford accident)

- Training programs and written procedures for identifying and mitigating hazards.
 - Startup, shutdown, emergency shutdown, and deviations from normal operating conditions.
- Conducting incident reporting following an employee injury or equipment damage.
- Operations are monitored and documented.
- Plant operators have access to skilled employees to address unique situations.
- Report summaries from other industries – Construction, aviation, oil rigs.

Safety culture survey results and performance

- Less of a questioning attitude yielded a higher numbers of allegations.
- Reporting safety concerns through the allegation program may indicate less confidence in their internal processes for identifying and resolving safety issues.
- Plants having lower overall safety culture survey scores were more likely to have: a) higher counts of unplanned scrams; and 2) inspection findings related to inadequacies in problem identification, resolution, and management commitment to safety.

Are the data good?

- The industrial safety accident rate is a less relevant measure of performance to an organization's safety culture as compared to other metrics.
- There are no established thresholds for determining a “healthy” or “unhealthy” safety culture.
- It is much easier to draw on the strengths of the safety culture to create change.
- Survey results obtained from: S. Morrow, G.K. Koves, V.E. Barnes, “Exploring the Relationship Between Safety Culture and Safety Performance in U.S. Nuclear Power Operations, *Safety Science*, 69, 37–47, 2014.

Test Interview

1. What motivates you to put forth your greatest effort?
2. How do you make important decisions?
3. Do you take calculated risks (Risk Management)?
4. What do you consider to be your most significant accomplishment, and why?
5. Describe your approach to transitioning employees into your department.
6. Have you ever reduced costs for your organization?
7. How do you handle conflicts between safety, cost, and schedule?
8. How do you motivate your employees?

Test Interview

9. Describe your approach to increase or decrease staffing to meet the work schedule.
10. What is it about your leadership style that allows you to meet your commitments?
11. What are your strengths and weaknesses?
 - Chocolate.
12. Why should we trust you?
13. Provide five words that describe you.

A Short Interview?

1. Can you perform the work assignment?
 2. Will you enjoy the work assignment?
 3. Can we work with you?
- Always transition from program-based questions to scenario-based responses.
 - These questions do not necessarily have a correct answer.

Negotiating / Interviewing

1. What are our collective and individual interests in this negotiation?
2. Is everyone involved in the outcome of this negotiation represented? If not, what should we do about their absence?
3. What do we want from this negotiation?
4. What are our major interests?
5. What does their plan seem to look like now?
6. What do we think of their plan? What could we do to change it?
7. What can they do without our agreement?
8. What can we do without their agreement?

Negotiating / Interviewing

9. How can we make it easy for them to do what we want and hard for them to do what we don't want?
10. What "yesable" propositions can we give them?
11. How do we best communicate all this to the other side?
12. How should we, as a group, proceed and make decisions during the negotiation?
13. Do we need a facilitator, recorder, flip chart, agenda, timetable?
14. How do we stay in agreement with ourselves?
15. How will commitments be made for our side?

Meeting with Employees – Field Locations

- Who is the site supervisor (i.e., chain of command)?
- What is the scope of work?
- Who issues/administers the scope of work?
- Who verifies completion of the scope of work?
- Is on-site training being completed?
- Are project documents, procedures and policies, and quality requirements accessible?
- Payroll, timesheet, and expense reports.
- Monitoring/approving costs and change orders.

Meeting with Employees – Field Locations

- Hiring Subcontractors through company.
- Drug screening and confidentiality of records.
- On-site records management - regular and confidential.
- Is anyone conducting quality audits?
- Backup/disaster recovery plan, location, and activation.
- Site access, badging and security escorts.
- Health and Safety Plan (HASP).
- Hazard Communication (HAZCOM) Plan.
- Bloodborne Pathogens Plan (BPP).
- Emergency preparedness and reporting.

Barriers to delegation (micro-managing)

- “If you want it done right, do it yourself.”
- Lack of confidence and trust in subordinates.
- Fear of being called lazy.
- Fear of competition from subordinates.
- Managing by crisis / always putting out “fires”.
- Reluctant to take risks in depending on others.
- Result: Lack of controls (**Feedback**) that provide early warning of problems with delegated duties.

When to say good-bye – A horrible relief!

- Contract ends or is terminated.
- Failure to achieve goals.
- Futility.

“You did not quit. You just know when to recognize futility.”

Comment to a colleague

Case Study - Blurred lines - Training

- Example: Numerous employees were turning up with expired training.
 - Is your training coordinator not performing job responsibilities?
 - How is completion of training verified?
 - What other departments or organizations support training efforts indirectly?