U.S. Department of Labor
Make the RIGHT Decision
Mine Safety and Health Administration

U.S. Department of Labor
SLAM Risks the SMART Way
Mine Safety and Health Administration

August Supervisory Sweeps

Presenter: Laura McMullen

Introduction

Today we are going to discuss

- **Human Factors**
- **Maslow's "Heirarchy of Needs"**
- **Human Barriers that Affect Performance**
- **The Four Types of Controls to Prevent Accidents**
- **"SLAM" and "SMART"**
- **History and Results of Human Factors Safety and Health Programs**
- **MSHA's Goal and Action Plan**

- **These are tools that will help the mining industry attain a <u>new level</u> of risk assessment and <u>long term</u> risk management**

Make the RIGHT Decision!

PURPOSE OF THE PROGRAM

Provide management and miners with the same tools that each can use on a daily basis to

- **Recognize Risk**
- **Manage Risk**

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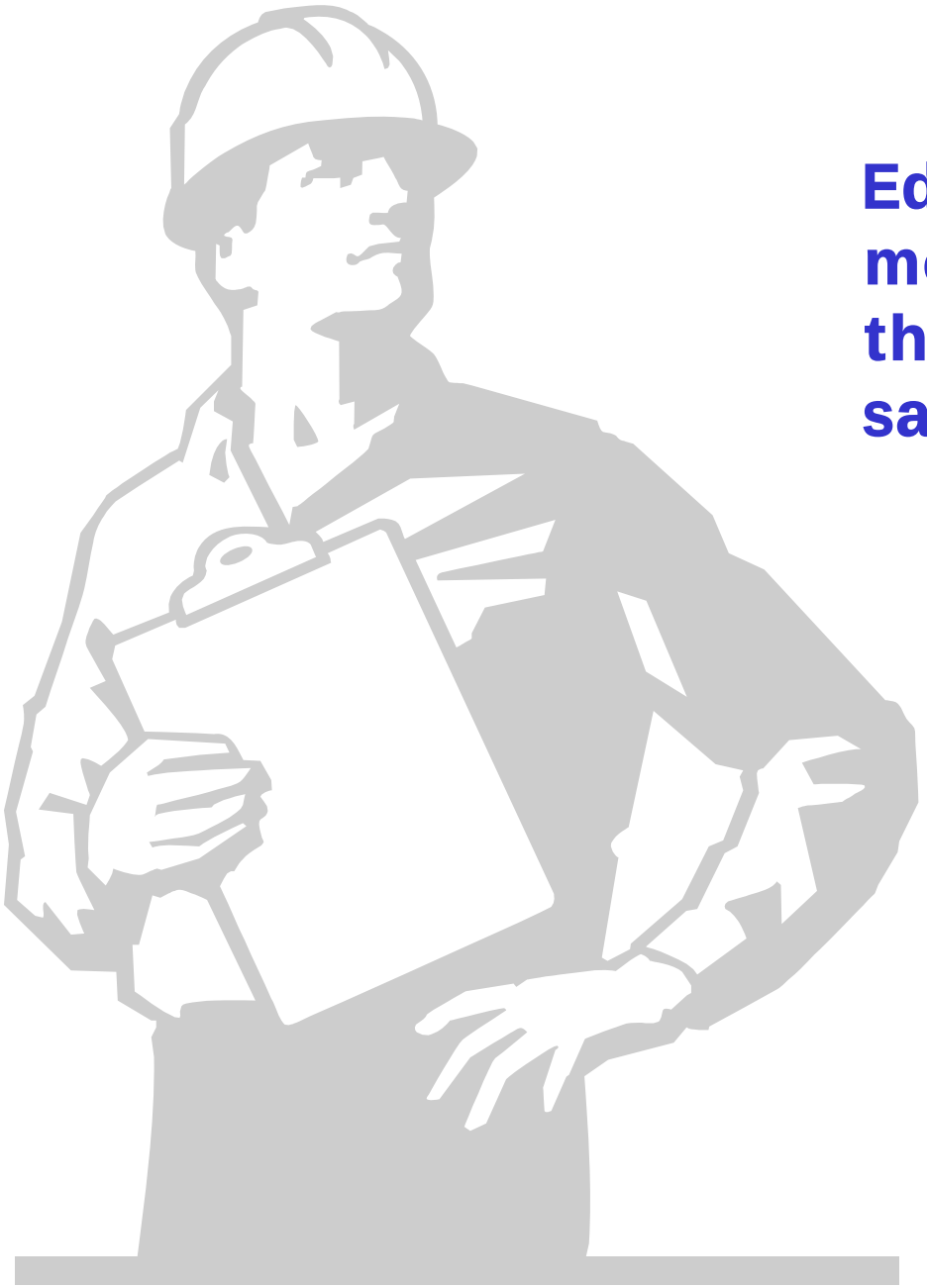

MSHA's GOAL

Educate miners on motivators that influence their decisions regarding safety and health

Help them to

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Main Menu

Menu

- Risk and Hazards
- The Four Types of Controls
- Human Factors
- SLAM for Small Mines "5 miners or Less"
- Human Barriers that Affect Performance
- SMART
- Maslow's Heirarchy of Needs
- Human Factors Safety and Health History and Results

- ACTION PLAN
- EXIT

WHAT IS RISK?

- **Risk is the combination of the likelihood that an accident or injury will occur and its potential severity**
- **A hazard is anything that has the potential to cause harm**
- **Harm is the negative affect on one's safety or health**

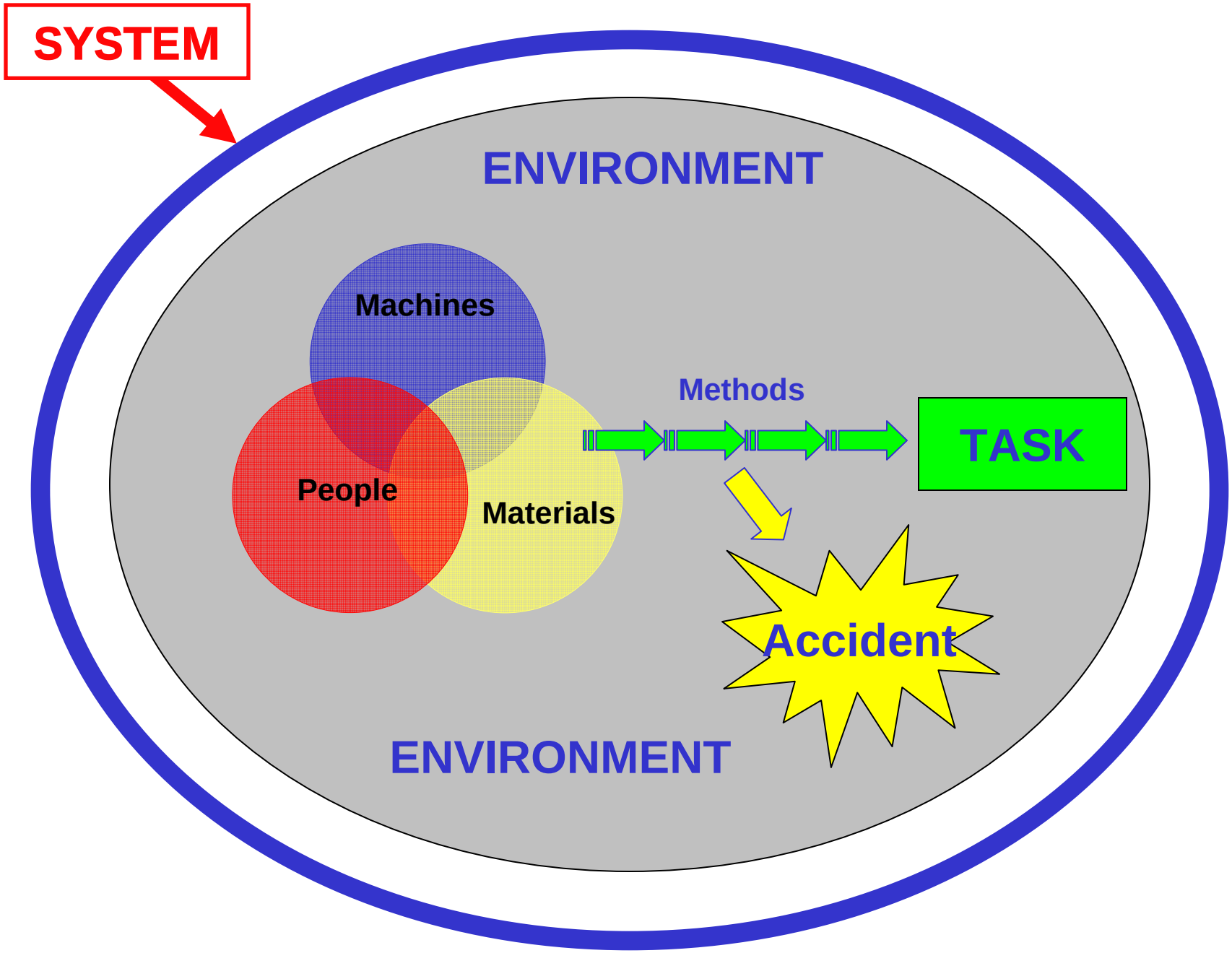
THERE IS RISK IN EVERYTHING WE DO

- **Regardless of the job in the mining industry, a potential for danger always exists**
- **Mining has few constant factors and many variables**
- **Environment, conditions, and human factors all impact this risk**
- **Risks must be eliminated or mitigated by identifying, evaluating, and controlling the hazards as each task is performed**
- **Performing this process on a recurring basis creates system safety and health**

WHERE DO WE BEGIN TO LOOK FOR THE HAZARDS?

In the "*SYSTEM*"

- The system is the composite of **people**, **machines**, and **materials** that are used to perform a specific task in a specified environment
- All components are interrelated so a failure of any part can cause a failure of the system
- Our risk assessment must take into account all the components and any associated hazards and human factors


SYSTEM
ENVIRONMENT
Machines
People
Materials
Methods
TASK
Accident
ENVIRONMENT

Methods not followed lead to accidents

We want to <u>focus</u> on the <u>motivators</u>

Focusing on motivators will help us influence the decisions that miners make about their safety and health

Mining Factors that Motivate Risky Actions

- **Production**
  Excessive emphasis or focus on production (e.g. condoning or encouraging unsafe acts during repairs or maintenance, excessive emphasis placed on production bonuses, etc.)
- **Inconvenience**
  It's often very inconvenient to follow safety & health regulations
- **Pride, Ego, or Fear of Appearing Incompetent**
  These attitudes prevent some miners from asking for help
- **Working Alone**
  Many times this increases the opportunity for at-risk actions

What are Human Factors?

Human attributes, susceptible to or representative of the sympathies and frailties of human nature, inconsistency of action or thought, the manner in which a person conducts oneself, can be influenced or motivated

Human factors is an **act** or **action** by an individual that can be **observed** by others.

Human factors is what a person **does** or **says**…
…not what they think, feel, or believe.

Feelings, attitudes, or motives **are not** human factors. They are internal aspects of a person that cannot be directly observed by others.

Describing Human Factors

Human factors descriptions should be:

Clear – to avoid being misinterpreted
Precise – to fit the specific human factors observed
Brief – to keep it simple

Chosen for their reference to the activity

The test of a good human factors definition is

whether the persons using the definition can accurately observe

if the target human factor is occurring

Describing Human Factors

EXERCISE

Determine which of the following human factors descriptions fit these criteria:

(1)“Is not paying attention”

(2)“acting careless”

- [x] (3)“keeping hand on handrail”

(4)“lifting safely”

- [x] (5)“moving knife away from body while cutting”
- [x] (6)“using knees while lifting”

Describing Human Factors

- At-risk human factors often allow for more immediate fun, comfort, and convenience than safe human factors.

- Most safe and healthy work human factors do not provide obvious and measurable feedback to the worker. Instead, most safety and health practices have intrinsic negative consequences such as discomfort, inconvenience, and reduced pace.

Smart Menu

The Two Types of Barriers

- **PHYSICAL BARRIERS**
  - ACCIDENTS THAT COULD HAVE BEEN PREVENTED BY SOME TYPE OF PHYSICAL BARRIER. A CONTROL IS A PHYSICAL BARRIER THAT HAS BEEN INSTALLED OR IMPLEMENTED.

- **HUMAN BARRIERS**
  - ACCIDENTS THAT COULD HAVE BEEN PREVENTED BY THE INDIVIDUALS INVOLVED. HUMAN FACTORS-BASED SYSTEMS AND PROGRAMS CREATE AN OPTIMUM SAFE WORK ATMOSPHERE WHERE WORKERS CHOOSE TO VALUE SAFETY.

The Five Major Barriers to Human Performance

1. INFORMATION
2. PROPER TOOLS
3. INCENTIVE
4. KNOWLEDGE
5. CAPACITY

INFORMATION

- EXPECTATIONS NOT CLEAR
- GUIDANCE TO PERFORMING THE TASK IS ABSENT OR VAGUE
- NO FEEDBACK ON HOW WELL A PERSON IS PERFORMING
- LACK OF CLEAR OPERATING PROCEDURES

PROPER TOOLS OR EQUIPMENT

APPROPRIATE TOOLS OR EQUIPMENT:

- **ARE NOT AVAILABLE**

- **IMPROPERLY DESIGNED**

- **RETRO-FITTED WITH FLAWS**

INCENTIVE

- UNSAFE PERFORMANCE REWARDED
- SAFE PERFORMANCE PUNISHED
- POSITIVE REINFORCEMENT FOR FOLLOWING SAFE PROCEDURES IS OVERSHADOWED BY NEGATIVE PEER PRESSURE
- COMPANY MONETARY INCENTIVE PROGRAMS THAT REWARD “ZERO” INJURIES CAN PROMOTE MINERS TO NOT REPORT ACCIDENTS

KNOWLEDGE

- PERSON DOES NOT KNOW HOW TO DO THE JOB SAFELY
- LACK OF EDUCATION, TRAINING AND EXPERIENCE ARE FLAGS FOR THIS PROBLEM
- EXPERIENCE AND TRAINING IN ONE AREA DOES NOT QUALIFY ACROSS THE BOARD

CAPACITY

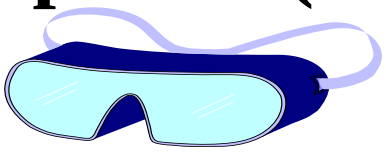
- INTERNAL TO THE PERSON
- CAN BE BOTH MENTAL AND PHYSICAL
- TASK EXCEEDS CAPACITY OF THE INDIVIDUAL
- SOMETHING IMPAIRS THE INDIVIDUAL'S CAPACITY
- EXAMPLES WOULD BE:
  - Equipment operator with a short attention span
  - Miner that has no peripheral vision
  - Impaired by alcohol or drugs
  - Mind is on other issues

Smart Menu

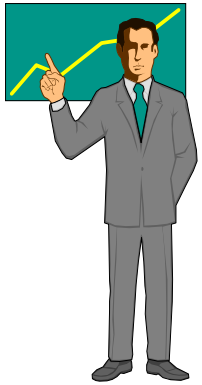
The Four Types of Controls

Engineering

Personal Protective Equipment (PPE)



People



Administrative

Smart Menu

Engineering Controls

Engineering Controls encompass:

- **A sound system design before use**
- **A redesign after a problem is discovered**

Examples of Engineering Controls

- Automating parts of the process
- Redesigning machine controls
- Reducing speed
- Using safer materials
- Ventilation (dilution or local)
- Enclosing, Isolating, or Absorbing
- Increasing or shortening distances

Administrative Controls

Administrative Controls encompass:

- Management's structuring of work activities and duties
- Management's implementation of instructional tools and reminders

Examples of Administrative Controls

- Rotating workers between jobs
- Rotating work schedules
- Establishing work procedures
- Putting up warning signs
- Eliminating certain jobs or tasks
- Improving education and training

Personal Protective Equipment Controls (PPE)

PPE Controls encompass:

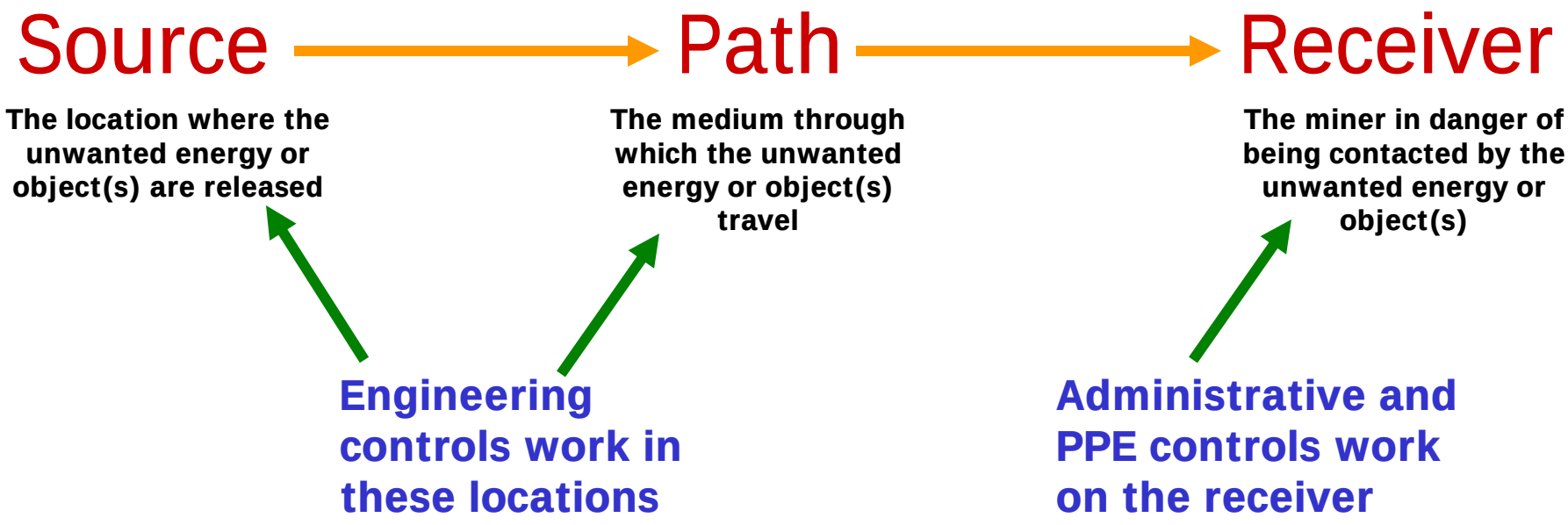
- Miners wearing an apparatus, device, or article of clothing that shields them from unwanted objects or energy

Examples of PPE Controls

- Respirators
- Hearing protection
- Gloves
- Boots
- Safety glasses
- Hard hats

Note: PPE controls should only be used while other controls are being developed, installed, or implemented; when additional protection is needed; or when hazards cannot be controlled any other way.

Determine the Optimum Place or Places for Controls to be Implemented

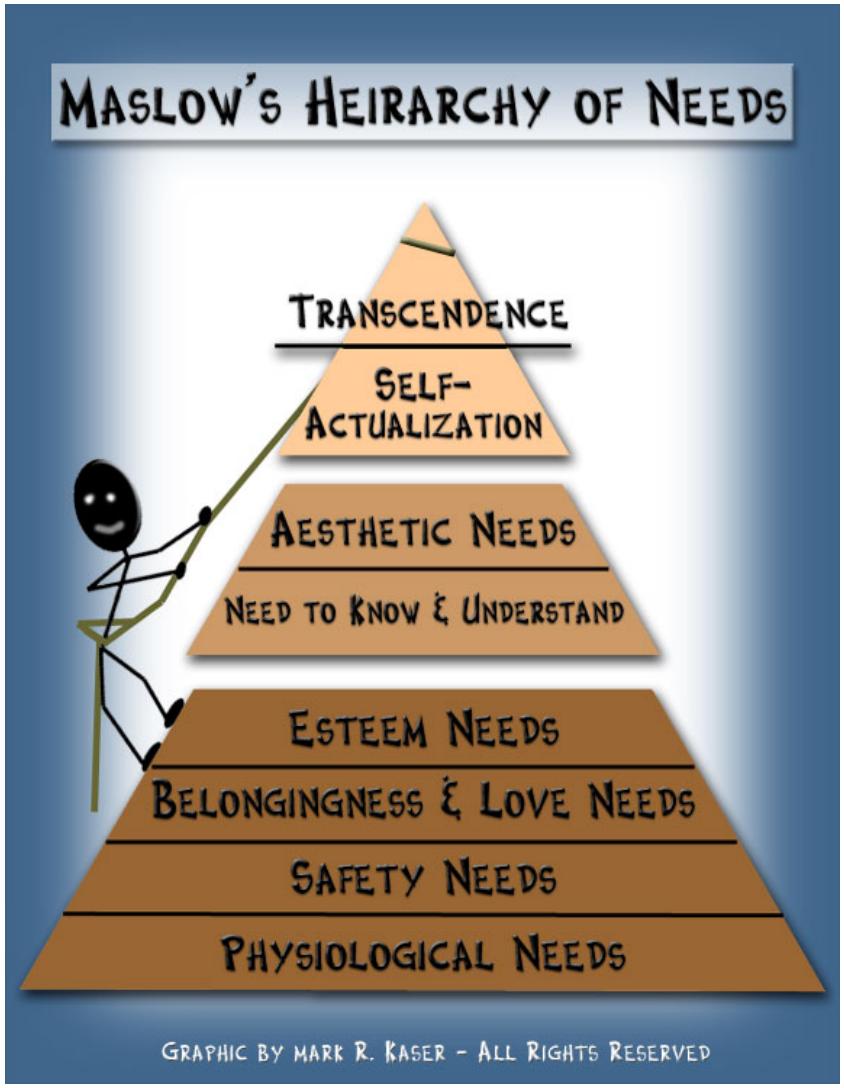


People controls implemented through human factors safety and health programs work on all three

Questions

Smart Menu

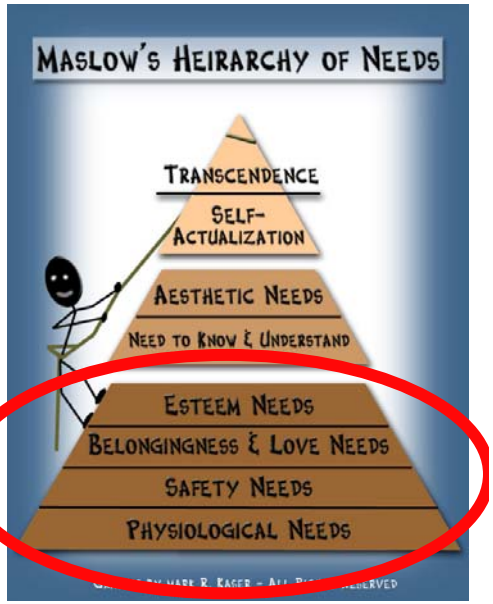
Addressing Human Factors

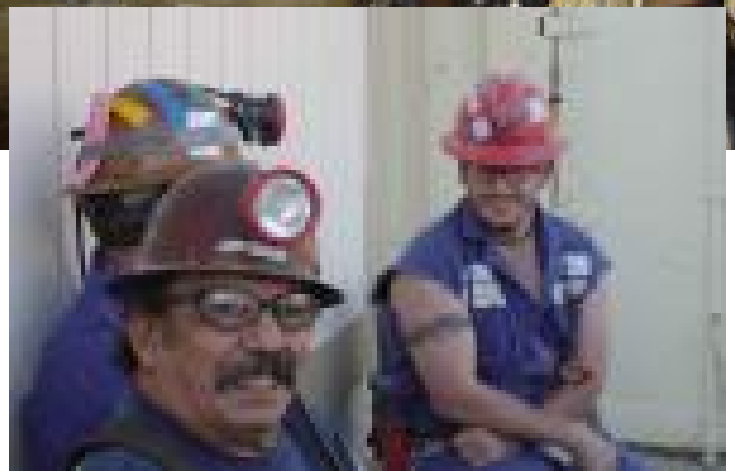


Make the RIGHT Decision!

Make the RIGHT Decision!

Psychological Needs
"Survival, Safety, Belonging and Self-Esteem"





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Psychological Needs
“Self-Esteem”

“Self-Esteem” is Critical

Thinking that someone is important or valuing that person

It helps people hold their heads high and feel proud about what they can do

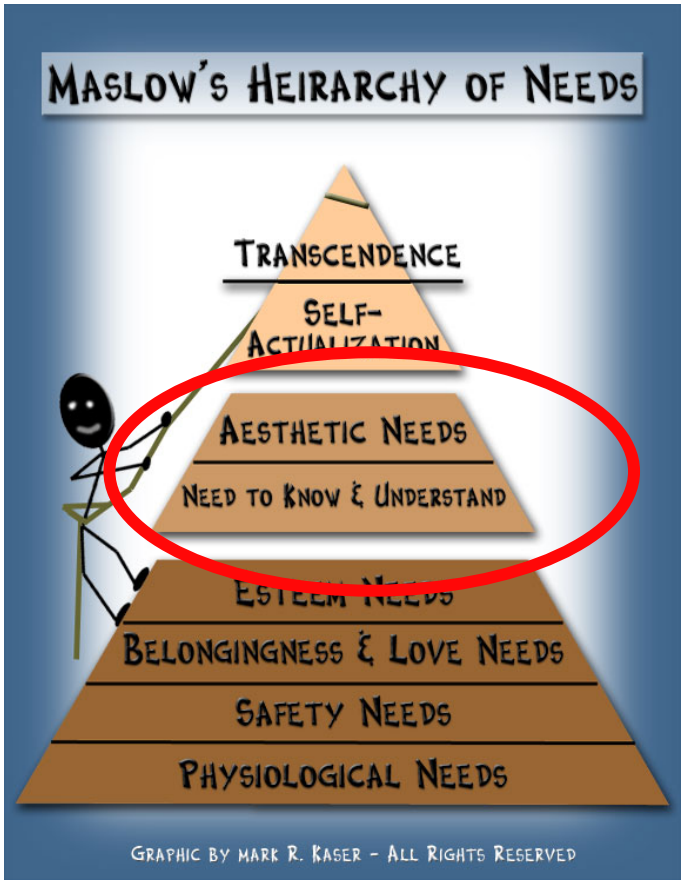
It gives them courage to try new things and
power to believe in themselves

It lets them respect themselves, even when they make mistakes

When they respect themselves, others will too

Aesthetic Needs

Haul Truck Training Simulator



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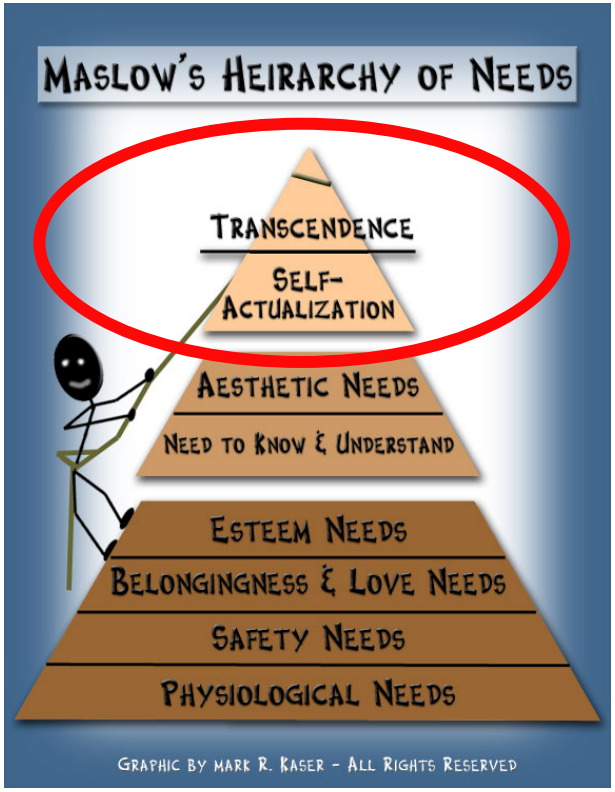
Hunger for Knowledge and Understanding

- **Miners have certain rights and responsibilities where safety and health are concerned.**
- **Please take a look at the booklet, Guide to Miner's Rights and Responsibilities Under the Federal Mine Safety and Health Act of 1977.**

Self-Actualization



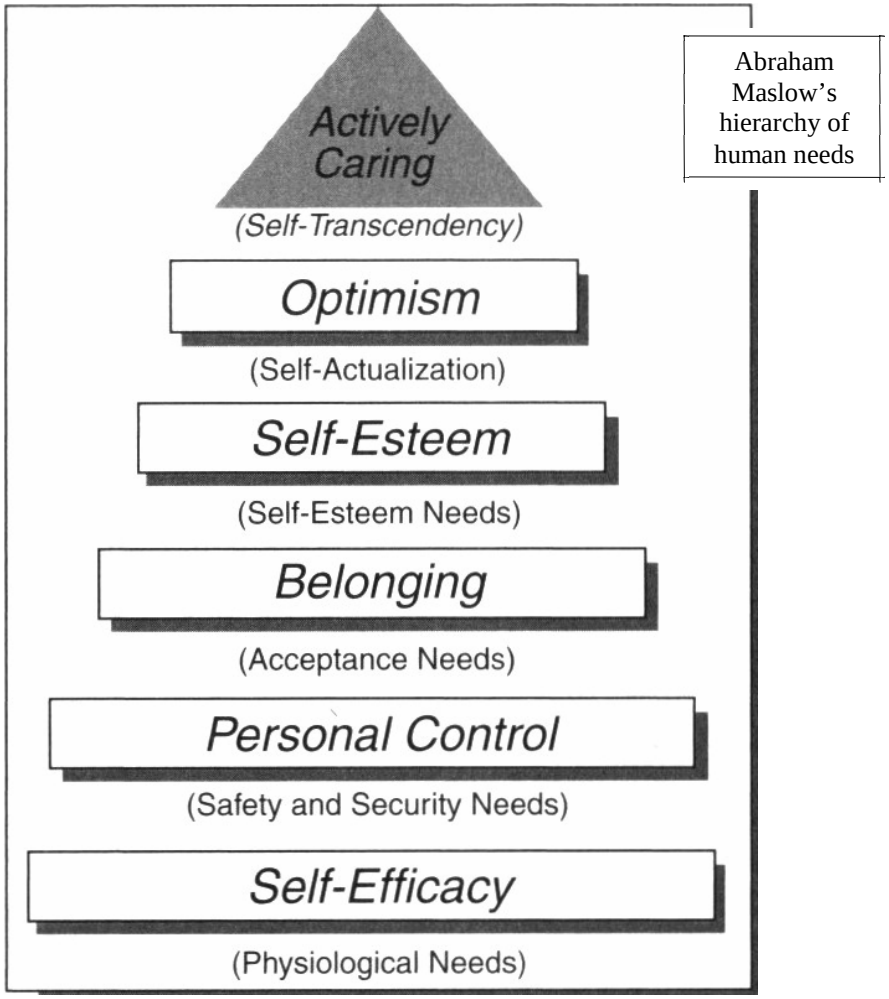
Independence!

Comfort with Oneself

Make the RIGHT Decision!

Self-Actualization Needs
Challenging Projects, Innovative Ideas, Creativity, and High Level Learning

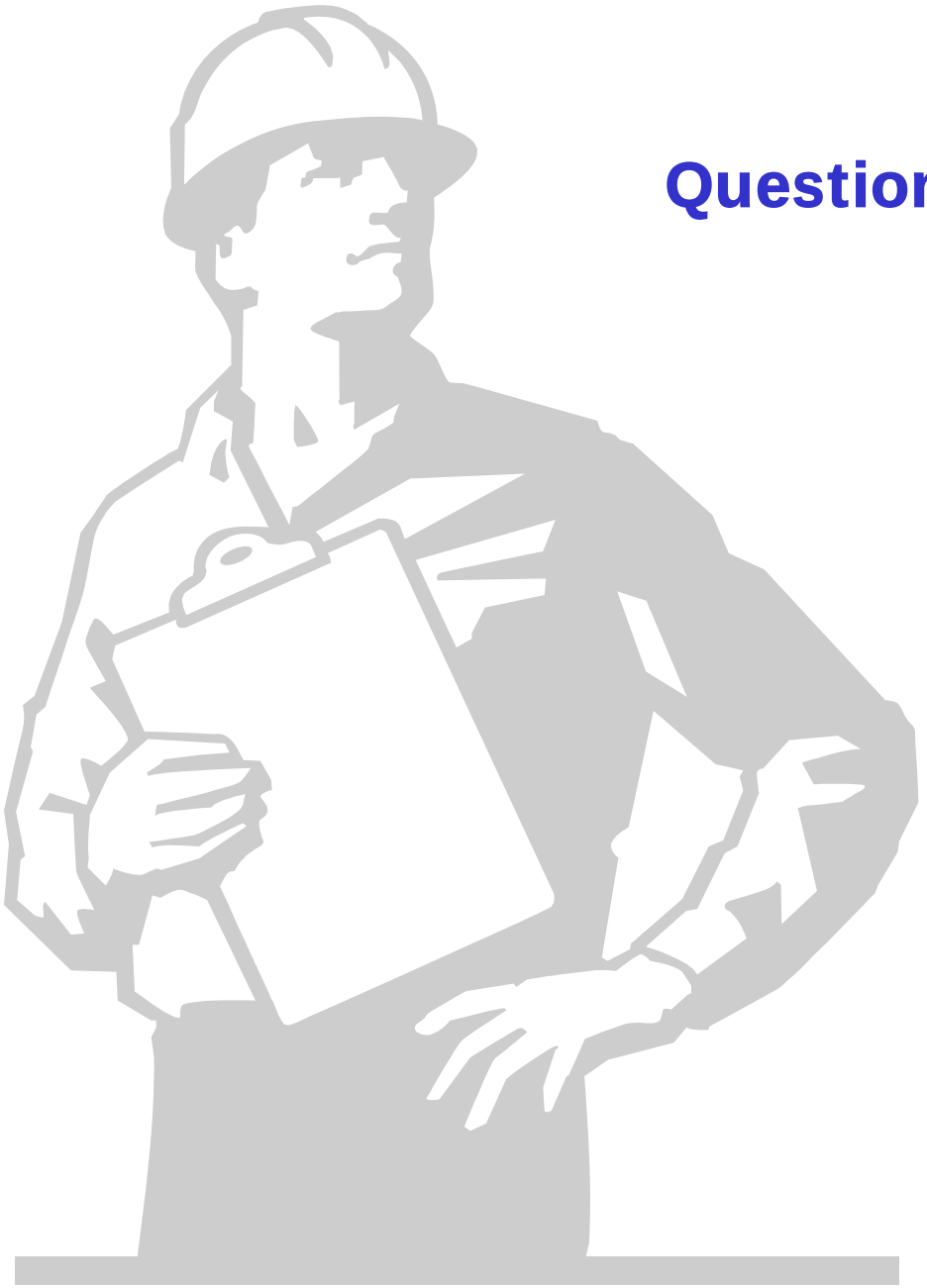
"On the Internet, nobody knows you're a dog."



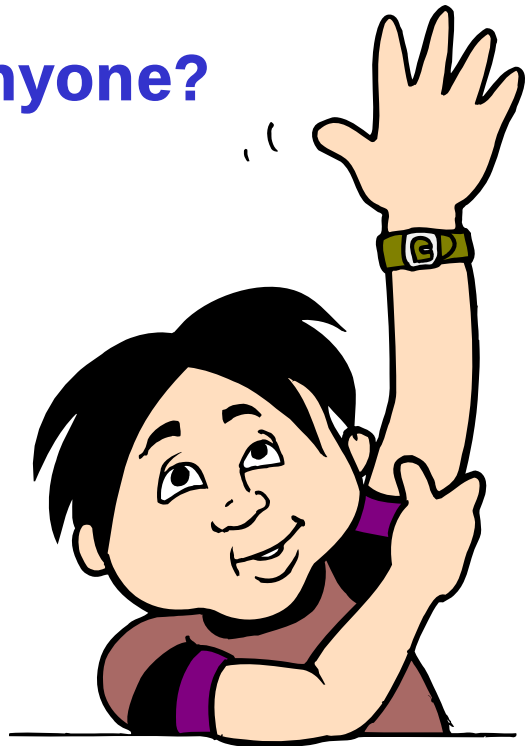
Abraham Maslow's hierarchy of human needs

Optimism = the extent to which a person expects the best will happen for him/her
Self Esteem = feelings of self -worth and value
Belonging = the perception of group cohesiveness or feelings of togetherness
Personal Control = the extent a person believes he or she is personally responsible for his/her life situation
Self Efficacy = general level of belief in one's competence

- To change human factors, management and miners must form a team that meets regularly to create an atmosphere where miners actively care for safety.
- Maslow's triangle depicts what this atmosphere must consist of to cause miners and management to decide to work safely and healthily.
- People value things in life such as family, friendships, and hobbies because of the elements in this triangle.
- When management & miners have these elements built into how they perform safety and health in the mine, they will choose to work safely and healthily because they value it.



Questions Anyone?



Smart Menu

SLAM

KEY PRINCIPLE

Personal risk assessment & management is a step-by-step process used to eliminate or mitigate risks before performing a specific task. The miner also uses it while the task is being performed and after the task is completed.

Main Menu

Risk Management for Miners (SLAM)

- **S**top – think through the task
- **L**ook – identify the hazards for each job step
- **A**nalyze – determine if you have the proper knowledge, training and tools to do the task
- **M**anage – remove or control hazards and use the proper equipment

STOP

- Not so fast!
- Freeze the situation for a moment and look at each step in the task
- Is this a new task?
- Has the task changed?
- When was the last time you did this task?
- Do you feel comfortable doing this task?
- If you do not, you need training

LOOK

- Always inspect the work area for potential hazards
- This step begins prior to starting any task, during the task, and after the task is completed
- Identify the hazards for each job step
- Evaluate what must be done in respect to the potential hazards

ANALYZE

- Determine if you have the
  - ☑ Knowledge
  - ☑ Skills
  - ☑ Training
  - ☑ Tools to do the task safely
- Think about what else you need in order to perform the task safely
- If you need help, ask for it
- If you need training, do not perform the task until you have been trained

MANAGE

- Take the appropriate action to eliminate or minimize any hazards that make the risk unacceptable
- Ensure that the proper equipment is used and that it has been well maintained
- Take account of the task just completed
- Did anything unanticipated happen?
- Address unplanned occurrences and plan for them in the future
- Share this information with other miners and mine management

Implementing SLAM

- **Regularly train and retrain miners on how to SLAM risks**
- **Regularly solicit new SLAM risk testimonies from the miners.**
- **Allow all miners to hear and discuss these testimonies.**

Main Menu

SMART

KEY PRINCIPLE

A dynamic risk reduction program is a roadmap and a vehicle that produces continual improvements in safety and health. This program is run by a team comprised of management and miners. The team constantly revises the program to solve problems created by specific risks.

Risk Management for Mine Operators

(SMART)

- **S**TOP – Isolate each step in a task and identify past and potential accidents, injuries, and violations
- **M**EASURE – Evaluate the risks associated with the task and barriers that have allowed hazards to cause injuries
- **A**CT – Implement controls to minimize or eliminate any hazards that make the risk unacceptable

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Risk Management for Mine Operators

(SMART)

- **REVIEW – Conduct frequent work site visits to observe work practices and audit accidents, injuries, and violations to identify root causes**
- **TRAIN – Develop a human factor-based action plan and then involve and train the miners**

Make the RIGHT Decision!

STOP

- **Develop one or more health and safety teams comprised of management and miners**
- **Teams must meet regularly to discuss accidents, violations, observations, audits, and testimonies of miners who have SLAMmed Risks**
- **Identify specific risky acts and tasks that need to be targeted**
- ***Share with all miners and incorporate their suggestions***

Audit Sheet for _____

(write work activity here)

Date _____/_____/_____

Page _____ of _____

ACCIDENT or VIOLATION	PROBLEM AREA			CAUSE				
	Examination	Installation	Correction	Information	Training	Tools/ Materials	Incentive	Capacity
Totals								

Sample Audit Form

MEASURE

- **Perform root cause analysis to find out why unsafe acts are happening**
- **List the barriers that permit these unsafe acts (physical, human)**
- ***Share with all miners and incorporate their suggestions***

Root Cause Analysis Form

_____

(write work activity here)

Date: ___/___/___ Shift: _____ Time: _____ am pm

Observer:_____ Miner Observed: _____

Human Factor No.	AT-RISK human factors PROBLEM AREA			CAUSE OF AT -RISK human factors				
	Examination	**Installation**	**Correction**	**Information**	**Training**	**Tools/ Materials**	**Incentive**	**Capacity**
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
Totals								

Sample Root Cause Analysis Form

ACT

- **Decide on one or more engineering, administrative, personal protective equipment (PPE), and people controls**
- **Install, require, and/or enact these controls**
- ***Share with all miners and incorporate their suggestions***

Make the RIGHT Decision!

Smart Menu

REVIEW

- Perform announced and unannounced observations where miners observe the work practices of other miners
- Miners must record their observations and discuss with the miners they have observed
- Perform audits on observations, violations, accidents, and SLAM testimony
- Share audit findings with miners and incorporate their suggestions

Make the RIGHT Decision!

Smart Menu

Critical Action Checklist for

__ _____

(write work activity here)

Date: ___/___/___ Shift: _____ Time: _____ am pm

Observer:_____ _____ ____ Miner Observed: _____

No.	Action	SAFE	AT-RISK	COMMENTS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
	TOTALS			

% Safe= Total Safe Observations ___ X 100 = _____ %
Total Safe + At -Risk Obs.

- Develop Critical human factors Checklists (CBC) for specific tasks and occupations
- List the safe human factors that must be performed to do the task safely
- List these human factors in order if applicable

Audit Sheet for _____

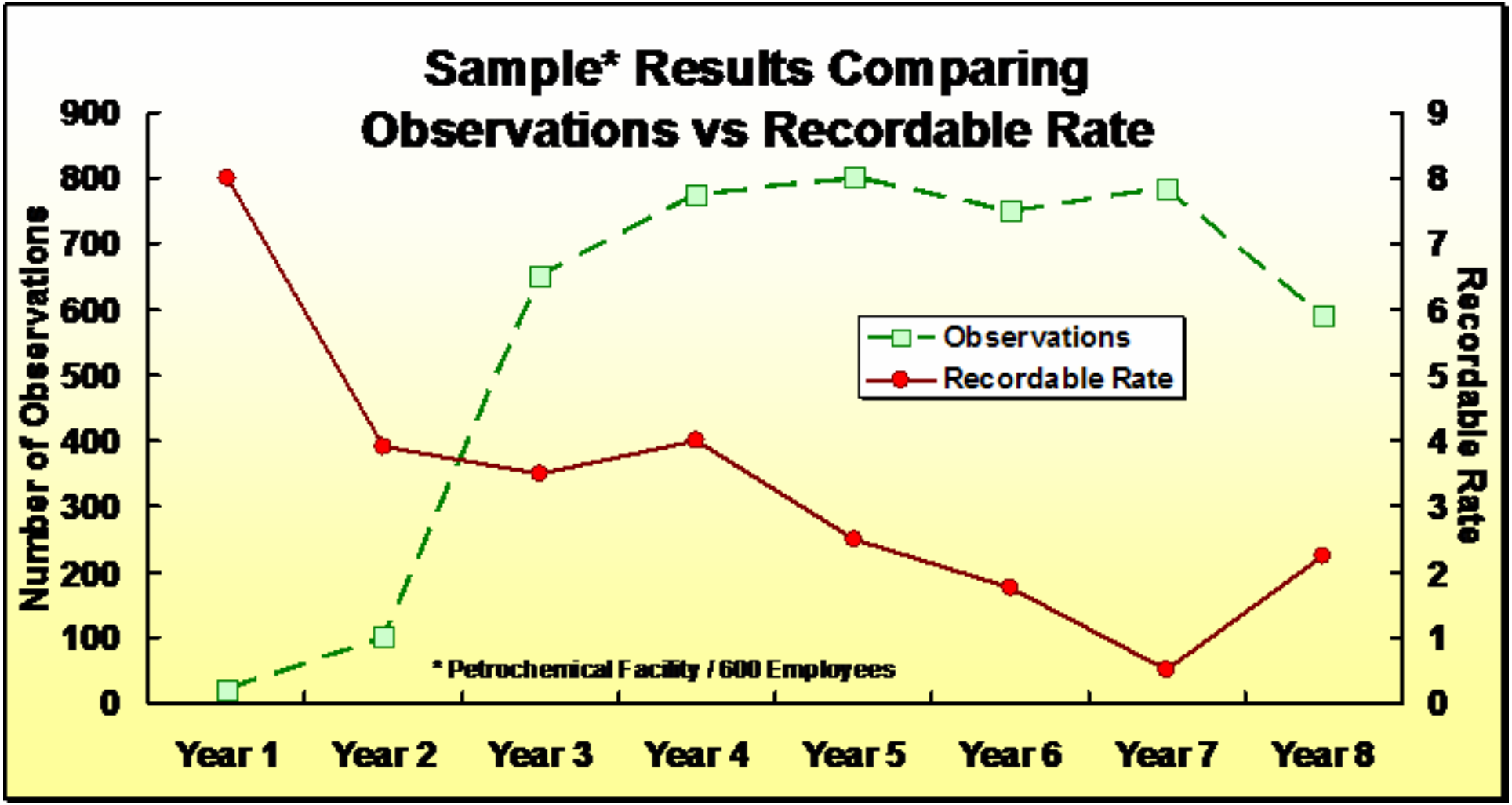
(write work activity here)

Date _____/_____/_____

Page _____ of _____

ACCIDENT or VIOLATION	PROBLEM AREA			CAUSE				
	Examination	Installation	Correction	Information	Training	Tools/ Materials	Incentive	Capacity
Totals								

Sample Audit Form


Sample* Results Comparing
Observations vs Recordable Rate
Number of Observations
Recordable Rate
900
800
700
600
500
400
300
200
100
0
9
8
7
6
5
4
3
2
1
0
Observations
Recordable Rate
* Petrochemical Facility / 600 Employees
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8

TRAIN

- Develop ingenious proactive and reactive human factors-based programs that will create a safe and healthy work culture at the mine
- Share with all miners and incorporate their suggestions
- Take safety and health to the next level by enacting these programs

Make the RIGHT Decision!

Smart Menu

Implementing SMART

Once the team knows the specific human factors they wish to target, they are ready to develop ingenious proactive and reactive human factors-based programs.

Once again, at-risk human factors often allows for more immediate fun, comfort, and convenience than safe human factors.

Because of this, there is a need for special intervention to direct and motivate

safe human factors.

There are Two Types of Interventions:

ACTIVATORS

&

CONSEQUENCES

Activators precede and direct human factors and are proactive.

Consequences follow and motivate human factors and are reactive.

ACTIVATORS

The ingenious use and management of signs, cards, commitments, pledges, etc. to stimulate and encourage workers to work safe. Activators proceed and direct human factors.

CONSEQUENCES

The ingenious use and management of incentives, rewards, disincentives, and punishments to motivate workers to work safe. Consequences follow and motivate human factors.

ACTIVATORS

The six keys to powerful activators:

- **Specify human factors**
- **Maintain significance with novelty**
- **Vary the message**
- **Involve the target audience**
- **Activate close to response opportunity**
- **Implicate consequences**

(1) SPECIFY Human Factors

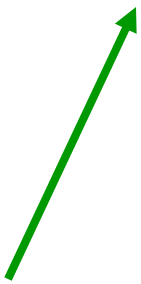
Signs that refer to a specific human factors are beneficial

Signs with general messages have very little impact.

EXERCISE – Promotional flyers were passed out a grocery stores. Three different messages were placed on the flyers to get the patrons to not litter by throwing the flyers onto the ground. Pick the message that you think worked best.

"Please don't litter. Please dispose of properly."

"Please deposit in green trash can in rear of store."



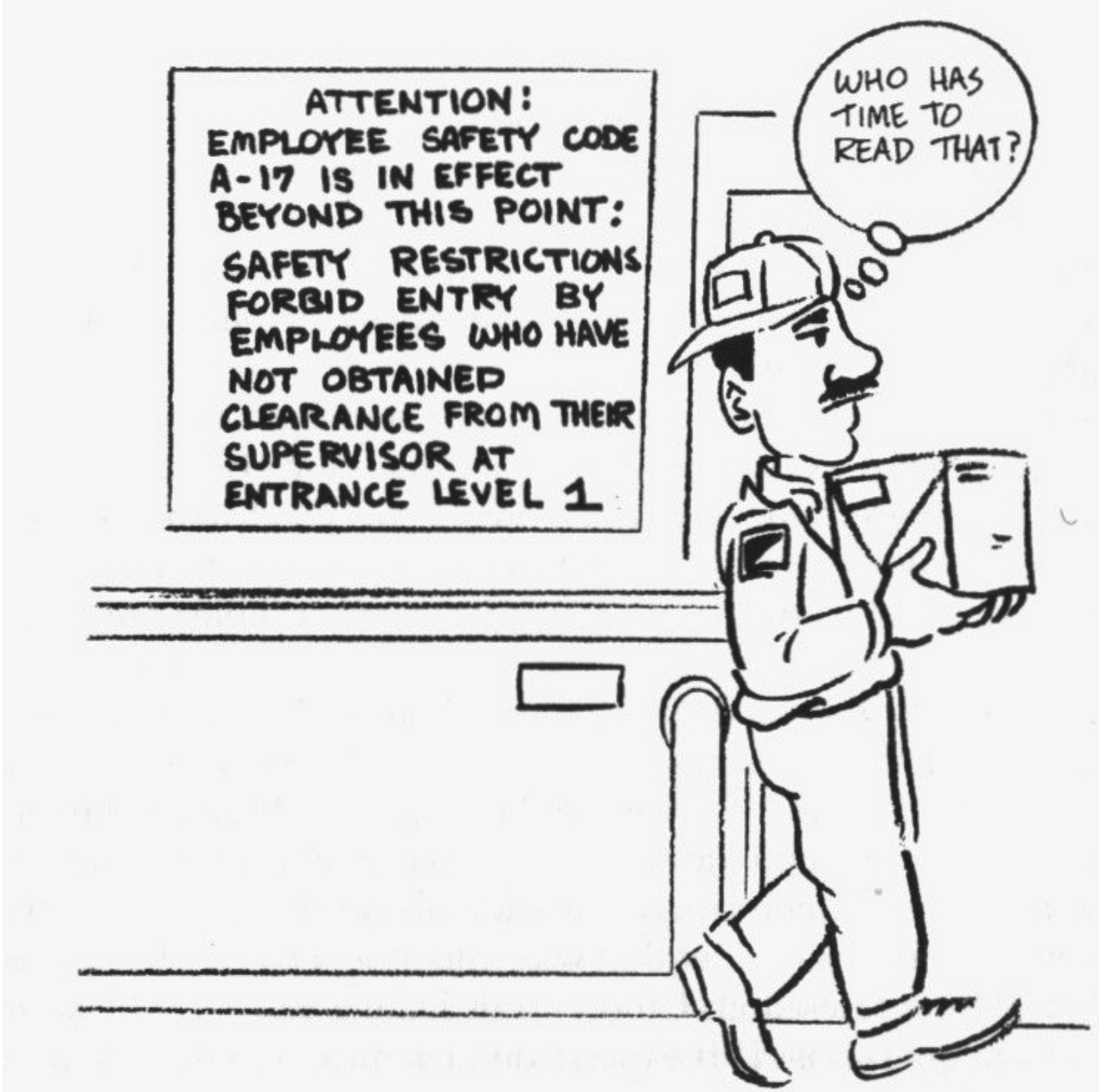
Equally ineffective – one as ineffective as the other

Drastically more effective – Up to 30% in trash cans

Smart Menu

Too many activators can be overwhelming and ineffective

Some activators are not specific enough.



Some signs are too complex to be effective.

(2) MAINTAIN SIGNIFICANCE WITH NOVELTY

Maintain the significance of activators by doing different and new things from time to time.

Failing to update activators for long periods of time causes workers to become bored with, and irresponsive to activators. This is called habituation.

EXERCISE – Can anyone tell me what the seat-belt reminder in your personal car sounds like?

Does this sound cause you to buckle-up?

EXERCISE – The effectiveness of different seat-belt reminders were tested. Pick the message that you think worked best.

A standard six-second buzzer or chime triggered by engine ignitions

A six-second buzzer or chime that initiated five seconds after ignition.

A voice reminder, "Please fasten your safety belt", that initiated five seconds after engine ignition and was followed by a "Thank you" if the driver buckled up.

EXERCISE – The effectiveness of different seat-belt reminders were tested. Pick the message that you think worked best.

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A voice reminder, "Please fasten your safety belt", that initiated five seconds after engine ignition and was followed by a "Thank you" if the driver buckled up.

Least effective

Most effective

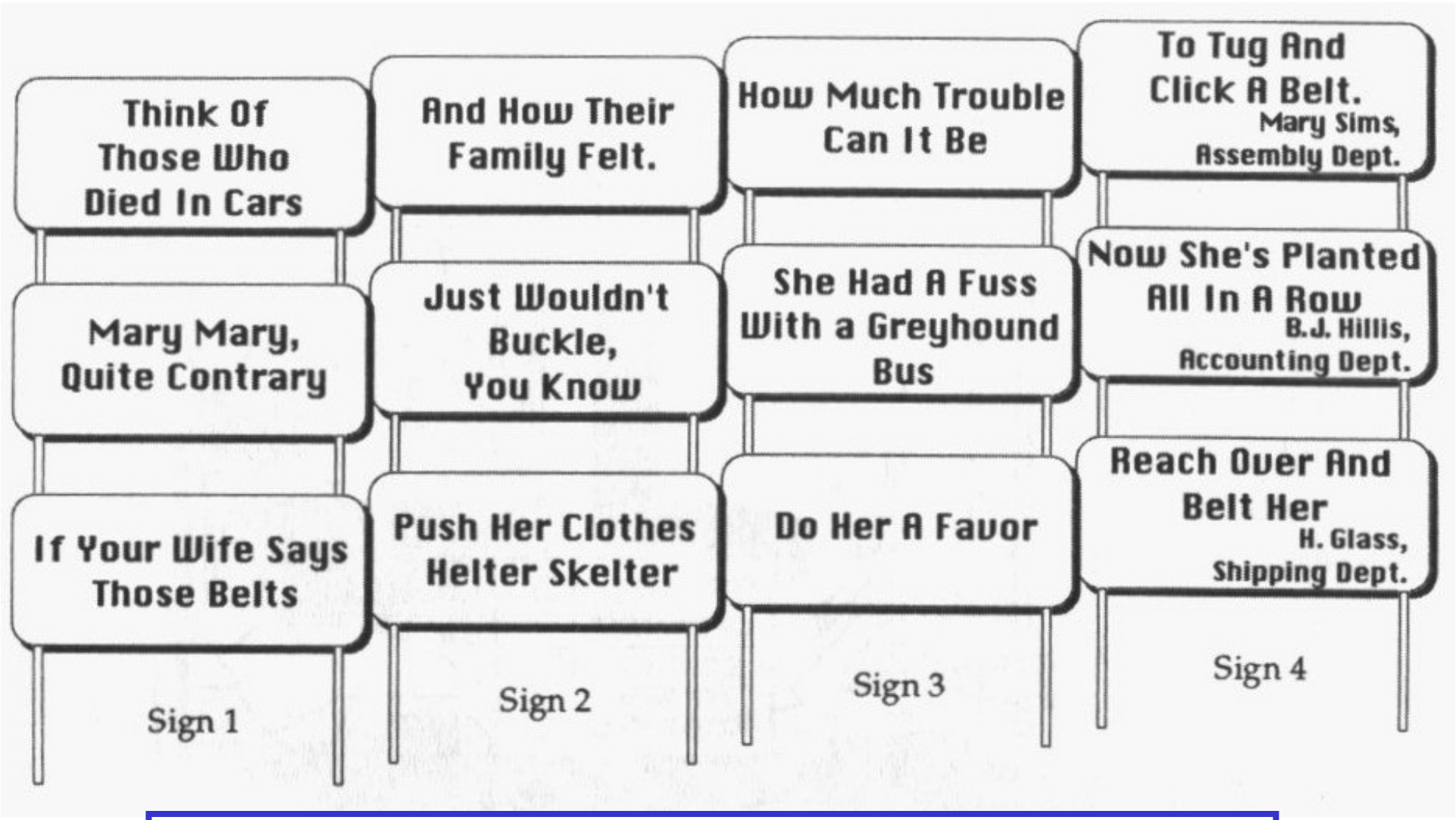
More effective

Habituation can cause irresponsive human factors to activators

(3) VARY THE MESSAGE

Self explanatory – Safety and health teams can get new ideas by having regular meetings. All miners with a certain job title should meet regularly. New ideas for messages can be obtained by asking miners to share something they did for safety since the last meeting. Miners should also discuss their near misses. Great ideas will come because these testimonies will be personal, genuine, and distinct.

Maslow Principle!



Changeable signs (vary the message) – notice how the author is given credit for the sign!

(4) INVOLVE THE TARGET AUDIENCE

Self explanatory – When people contribute to a safety and health effort, their ownership of and commitment to safety increase. Also, when individuals feel a greater sense of ownership and commitment, their involvement in safety achievement is more likely to continue. People feel like they belong and that they have control.

Maslow Principle!

Some activators imply ownership and increase actively caring.

(5) ACTIVATE CLOSE TO RESPONSE OPPORTUNITY

Activators should be physically positioned close to the location where the human factors will be performed.

EXAMPLE – post the safe work procedure lists near the locations where electricians will have to perform the work activity on the list.

EXERCISE - A study was performed on the effectiveness of TV commercials in getting drivers to buckle-up. For the control group (the group receiving no messages), the 10-month mean was 8.2% for males and 10.3% for females. Pick the mean you think was for the group getting the TV messages.

8.4% males	11.3% females
15.2% males	20.6% females
30.1% males	47.7% females

(5) ACTIVATE CLOSE TO RESPONSE OPPORTUNITY

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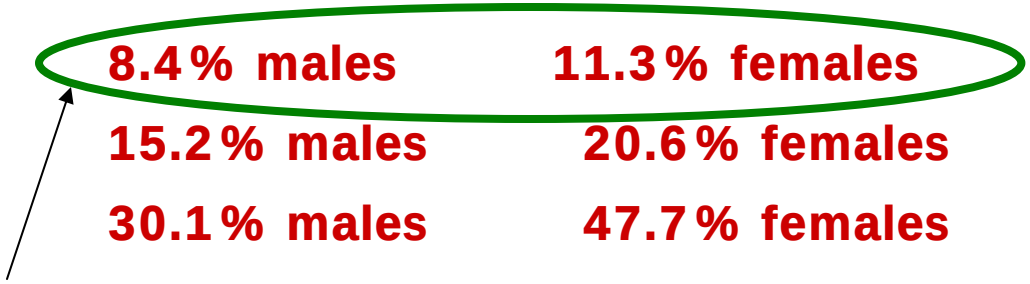
EXAMPLE – post the safe work procedure lists near the locations where electricians will have to perform the work activity on the list.

EXERCISE - A study was performed on the effectiveness of TV commercials in getting drivers to buckle-up. For the control group (the group receiving no messages), the 10-month mean was 8.2% for males and 10.3% for females. Pick the mean you think was for the group getting the TV messages.



TV message mean – very ineffective because it was too far removed from the desired human factors

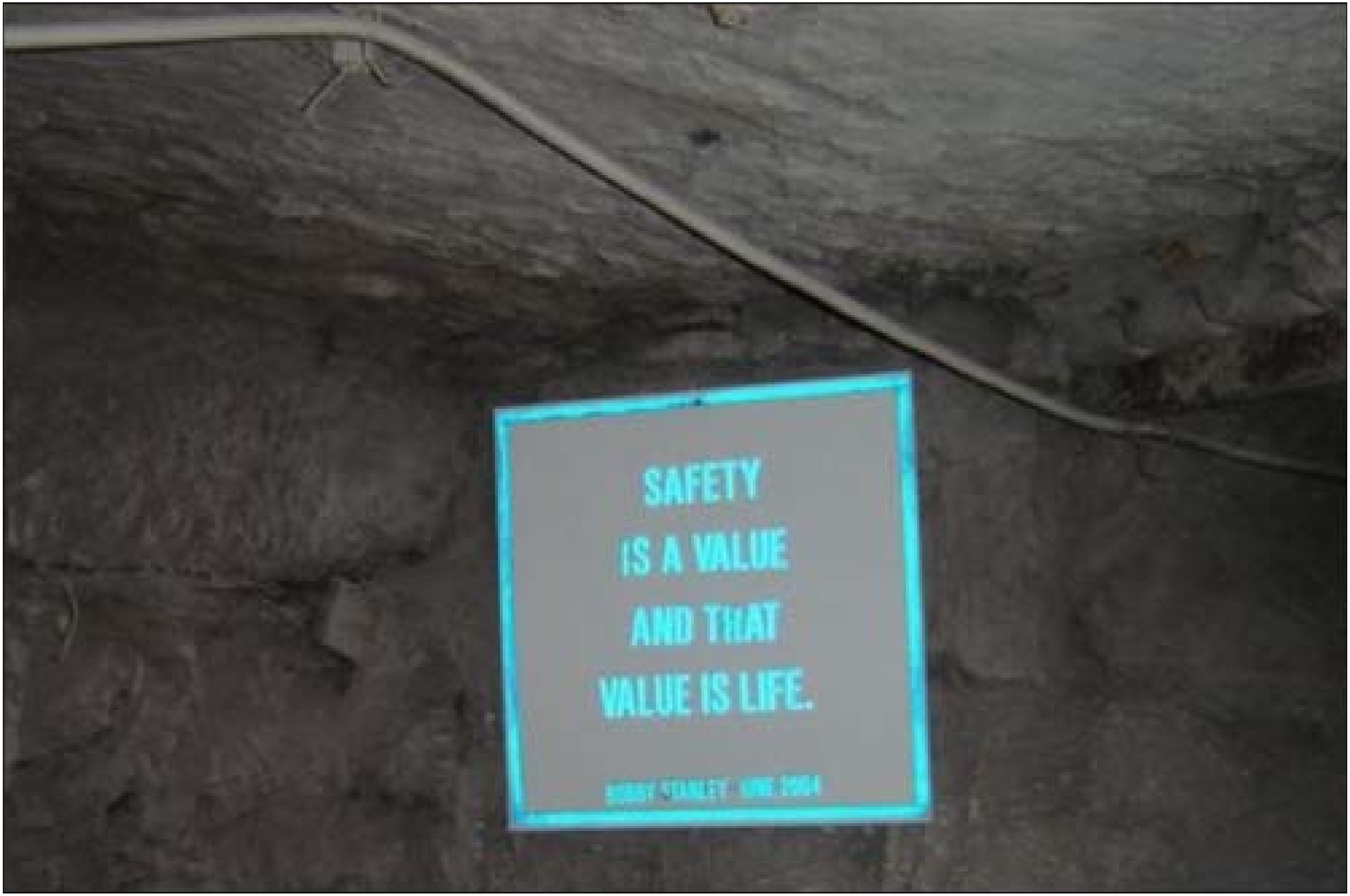
(6) IMPLICATE CONSEQUENCES

Activators should have obvious or implied consequences or they may be ineffective. These consequences can be positive and negative. Positive consequences are called incentives and negative consequences are called disincentives. Incentives usually are in the form of some reward, where as disincentives usually are some form of penalty.

The subject of direct consequences as interventions will be discussed later. But for now, the amount of power an activator has to motivate human factors depends on the consequence it signals.

ACTIVATOR EXAMPLE

The most powerful activators imply immediate consequences.


SAFETY
IS A VALUE
AND THAT
VALUE IS LIFE.

Smart Menu

CONSEQUENCES

The ingenious use and management of incentives, rewards, disincentives, and punishments to motivate workers to work safe. Consequences follow and motivate human factors.

Most safe work human factors do not provide obvious and measurable feedback to the worker.

In fact, most safety practices have intrinsic negative consequences such as:

(1) Discomfort,

(2) Inconvenience, and

(3) Reduced pace.

These intrinsic negative consequences discourage safe work human factors.

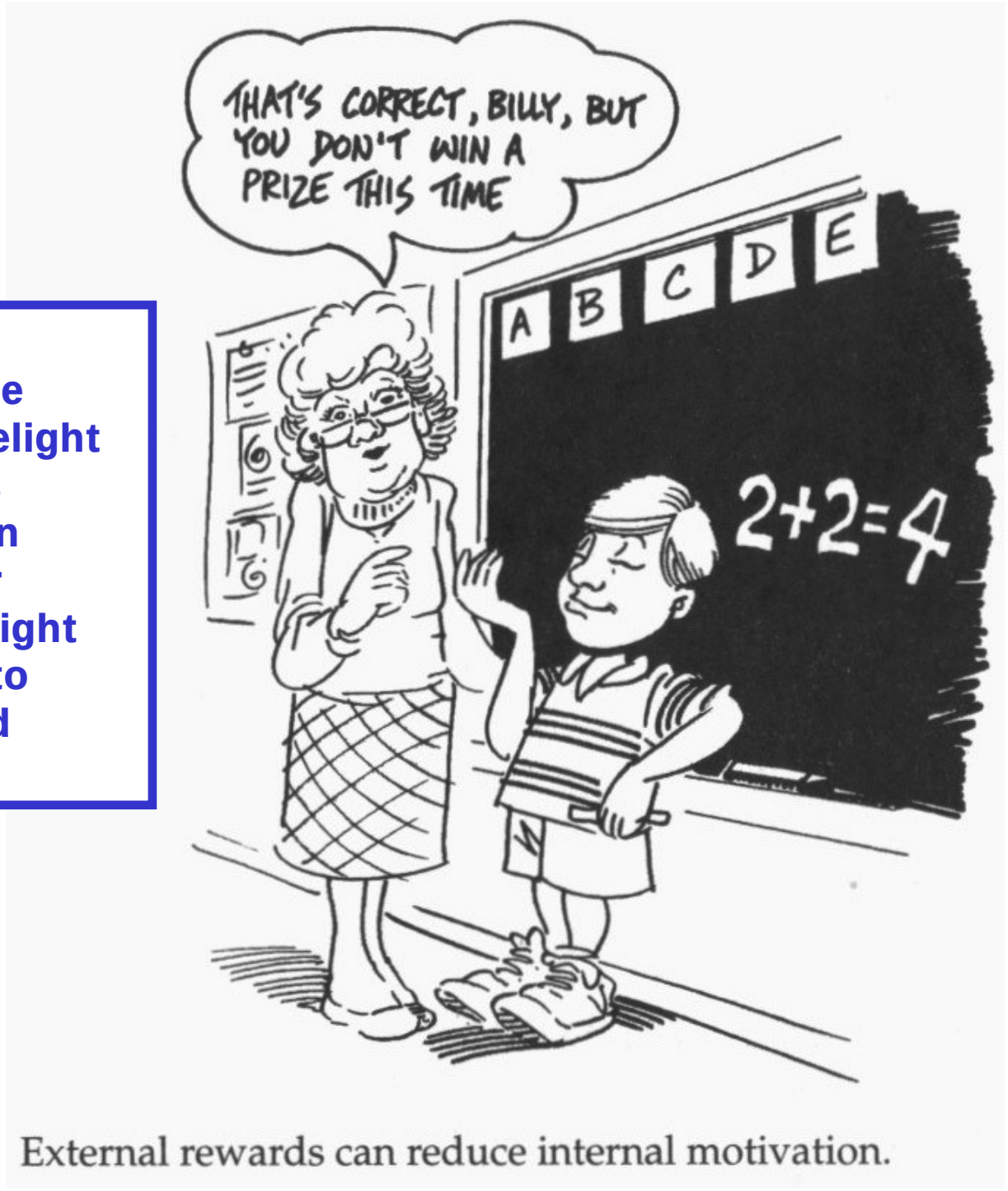
Because of intrinsic negative consequences, there is often a need for intentionally added supportive consequences.

Once again, extra positive consequences are necessary when the natural consequences are insufficient to motivate safe human factors and/or discourage safe human factors.

Intermittent praise, recognition, novelties, and credits redeemable for prizes are powerful consequences that motivate safe human factors. These methods are keys to maintaining continuous safe and healthy human factors for long periods of time.

It's important that workers perceive doing a task correctly as valuable and rewarding. For this reason, praise and recognition should be intermittent.

If the teacher displays genuine approval and delight in the student's achievement, an extra reward or consequence might not be needed to encourage good performance.



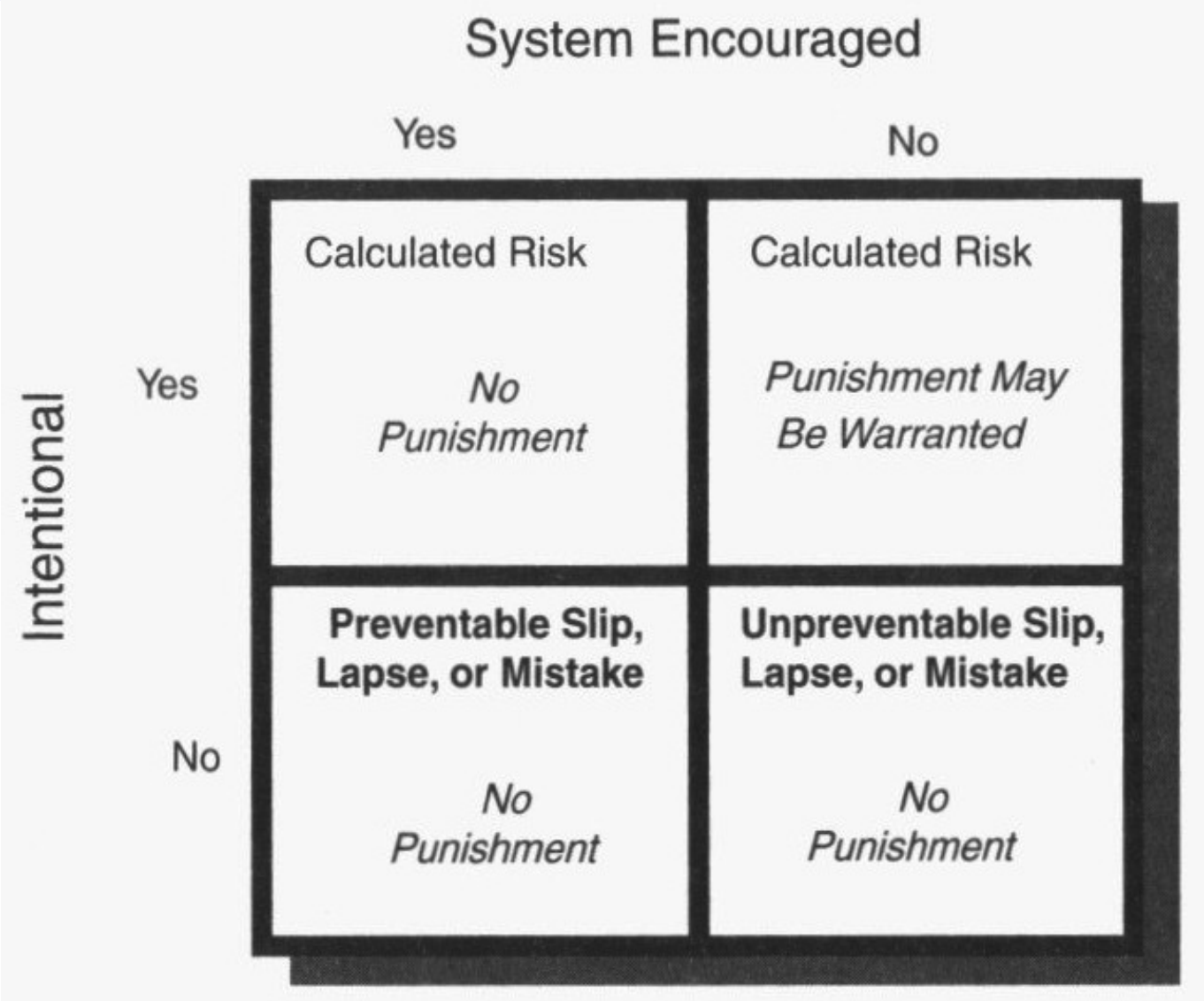
External rewards can reduce internal motivation.

It’s important that incentives and rewards are not given in a way in which people feel controlled.

People must believe that they truly earned the consequence through their own efforts.

Maslow Principle!

Punishment Consequences



Punishment is only warranted when the undesirable human factors is intentional and not encouraged by the work culture

A powerful human factors punishment strategy is to have a worker conduct a root cause analysis of his/her actions.

- **The person should then develop a personal corrective action plan to correct his/her human factors. If a supervisor agrees with the plan, the worker should sign the plan.**
- **When a person signs a commitment that took some effort to develop, the probability of compliance is greatly enhanced.**

Punishments must be fair and everyone must be treated the same!

REWARDS

Effective incentive / reward programs satisfy the following:

- **Human factors required to achieve a safety reward should be specified and perceived as achievable by all participants.**
- **Rewards should be given soon after safe human factors are observed.**
- **Workers should select the rewards they would like to receive. *MASLOW PRINCIPLE!***
- **Everyone who meets the safe human factors criteria should be rewarded.**

REWARDS

- It is better for many participants to receive small rewards than for one person to receive a big reward.
- The rewards should be displayed and represent safety achievement. Coffee mugs, hats, shirts, sweaters, blankets, or jackets with a safety message are preferable to rewards that will be hidden, used , or spent.
- Contests should not reward one group at the expense of another.
- Groups should not be penalized or lose their rewards for failure by an individual.
- Progress toward achieving a safety reward should be systematically monitored and publicly posted for all participants.

Rewards that miners have chosen.

Industry Privileges
Time off
Extra Break
Refreshments
Preferred parking
Special assignment

Exchangeable Tokens
Cash
Food coupon
Ticker to an event
Rebate coupon
Gift certificate

Useful Items
Coffee mug
Litter bag, Car wax
Tire gauge
Umbrella, Pocket knife
Flashlight, Pen

Chance to Win a Contest
Lottery ticket
Bingo number
Poker card, Game symbol
Raffle coupon

Promotional Items
Safety button
Bumper sticker
Key chain
Hardhat sticker
T-shirt

Social Attention
Name in newspaper
Posted picture
Letter of commendation
T. V. interview
Handshake, Thank-you card

A variety of possible rewards are available to motivate safe behaviors in organizational settings.

Raffle drawings that result in few "lucky" winners and many "unlucky" losers can do more harm than good.

Safety contests can motivate unhealthy competition.

Rewards with safety messages are special to those who earn them.

EXAMPLE: The Hoechst Celanese company of about 2,000 employees developed a plant-wide incentive program. When employees were observed performing safe human factors, they received immediate praise and a "credit". At the beginning of the year, each worker received a "safety credit card" for tallying ongoing credit earnings. Only the late reporting of an injury was penalized by a loss of credits. At the end of the year employees exchanged their credits for a prize of their choice.

EXAMPLE: In 1994, a Toyota Motor manufacturing plant in Kentucky received 35,000 suggestions from its 6,000 employees. More suggestions were expected in 1995. Here's why. The employees received timely feedback regarding the utility and feasibility of every suggestion. If the suggestion was approved, they were empowered to implement it themselves. Also, the individual or team responsible received 10% of the savings for the first year the suggestion was implemented.

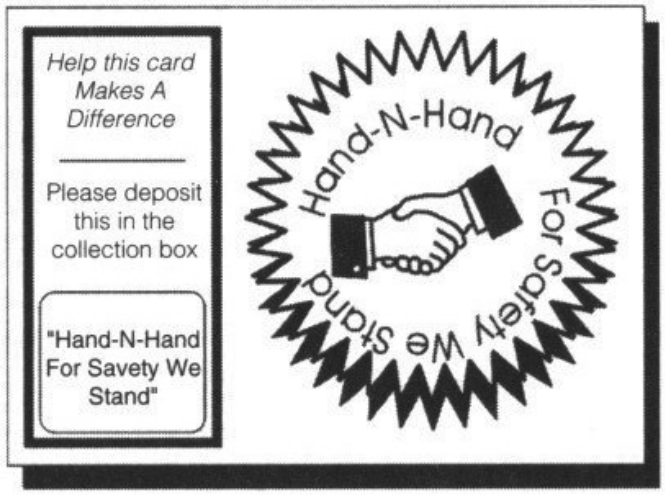
THANK YOU CARDS

Thank-you cards are incentives and rewards that have been used by many companies with great success.

When workers observes a fellow employee working safely, they fill out the card and give it to them.

One company designed a card with a peel off sticker which allowed the recognized employee to place on his/her hard-hat or dinner bucket.

front of card



back of card

This Actively Caring Thank-You Card offers reward leverage.

Front

C.C. Manufacturing

Thank You for ACTIVELY CARING

Date: _____

Please describe specifically the observed ACTIVELY CARING behavior: (see back for examples)

_____

_____

_____

_____

_____

_____

Observer's Code:

The first letter of the city where you were born	The first letter of your mother's maiden name	The number of the month you were born
_____	_____	_____

Recipient's Code:

The first letter of the city where you were born	The first letter of your mother's maiden name	The number of the month you were born
_____	_____	_____

_____ ¢ **Thank You** Limit: 55 ¢

Observer's Name _____

Recipient's Name _____

Back

Examples of ACTIVELY CARING Behaviors

- Recognizing and correcting an unsafe condition
- Reminding a coworker not to perform an unsafe act.
- Removing or cleaning unsafe objects or debris from a work area.
- Giving positive feedback to a coworker for working safely.
- Reporting a near miss.
- Making a task safer.
- Other

_____

Hoechst Celanese

Elaine George Dave Salyer

Tom Tillman Jim Woods

Department 1490

Employees can use a thank-you card to recognize each other's safe behavior.

MSHA's Motivational Tools for Miners

MNM Large Mines FRONT

United States Department of Labor
MSHA
Mine Safety and Health Adminstration

Thank you for

"making the RIGHT decision!"

MNM Large Mines Back

I care about my safety and health!

I am a RISK SLAMMER!

Smart Menu

Exxon, Ford, General Motors, and Westinghouse are examples of companies that have used thank-you card programs.

Some companies allowed thank-you cards to be exchangeable for gifts, or displayed them on a bulletin board as a “safety honor roll”.

Some companies put safety messages or logos on the gifts that signified safety achievement.

A few companies set up an additional collection container for thank-you cards. Every card deposited in this container was worth 25 cents to a charity or needy families.

Another company affixed a value of $1.00 to cards deposited in a special box, to purchase toys for disadvantaged children. The children of the employees picked out and delivered the toys.

MYSTERY OBSERVEE PROGRAM – The NORPAC paper mill developed an ingenious program. 35 of 450 workers volunteered to be "mystery-observers". These volunteers received a coupon for a meal for two at a restaurant. The mill workers were challenged to complete a critical human factors checklist (CBC) on a co-worker every week. If a worker happened to select a mystery-observer to observe, the mystery-observer gave a reward coupon to the observer. The observer then became a mystery-observer and had the chance to reward someone else.

SETTING GOALS

- **Effective goals are goals that are activators with implied consequences**
- **Human factor goals hold people accountable for the decisions they make.**
- **Goals need to be measurable, personal, and attainable.**
- **Establishing goals that employees feel they can not control, causes negative stress or distress, and encourages under-reporting of accidents. The only control workers have over injuries and accidents, is the ones that involve their direct contribution.**
- **One injury in the workplace, perhaps resulting from another person's carelessness, ruins the goal of zero injuries. This leads to a perception of failure and no one likes to feel like a failure.**

"Zero Injury" goals should be the *aim* and *purpose* of a safety vision or mission. It should not be the daily goal for workers.

Goals should focus on the human factor processes that need to be in place to reduce injuries and accidents.

Goals should:

(A) Define what will happen when the goal is reached (the consequences),

(B) Track progress toward reaching the goal, and

(C) Provide rewarding feedback when intermediate steps are completed. This feedback is in itself is a consequence that motivates continued progress.

It is critical that people asked to work toward a goal "buy in" or believe in the goal.

- **Process-focused and achievement-oriented goals work because they are not outcome-based and injury-focused.**
- **More importantly, these goals are employee driven.**
- **Workers are motivated to initiate the safety process because it is their idea.**
- **They get involved in the process and own it and stay motivated because the goals are a roadmap which tell them**

a. **Where they are going,**

b. **when they get there,**

c. **and how to monitor their progress along the way.**

- **Human nature is very fragile and delicate.**

- **Small changes in how we do business can create**

huge changes in the safety and health culture at the mine.

- **The changes may seem insignificant, but it can be exactly what is needed.**

IMPORTANT

We should not expect the adding of activators or consequences to improve safety over the long term if powerful consequences exist at a company that encourage at-risk decisions. In these cases it is necessary to change the existing system first.

The human factors that are motivated are the human factors that are performed!

History & Results

Human Factors Safety and Health

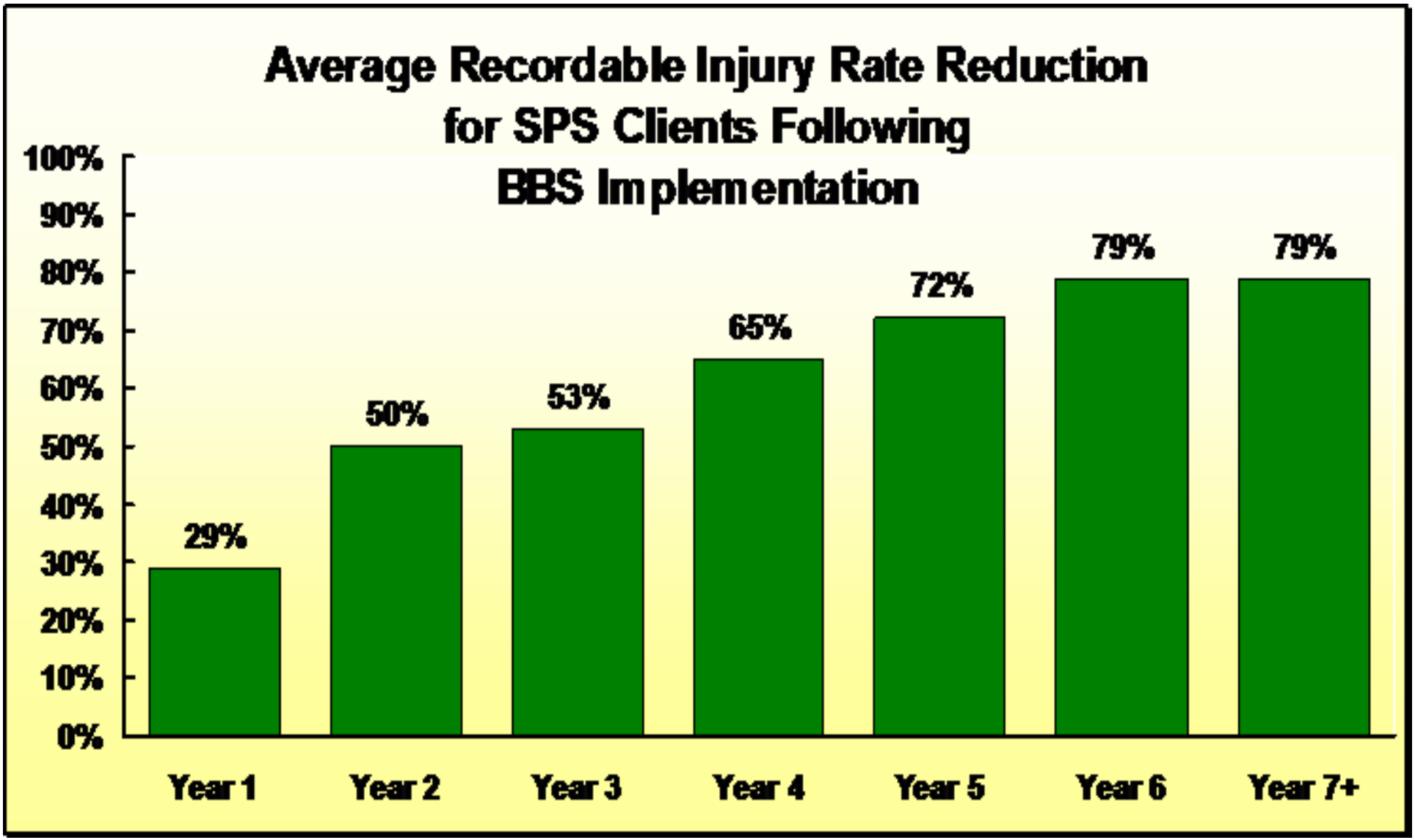
Human Factor safety methods have been used in the US since 1990. They have been proven to cause workers to:

- **Decide to work safe and healthy**
- **Individually make the change from working unsafe and unhealthy to working safe and healthy**
- **To reduce accidents by up to 50% in the first year**

Companies that have human factors-based health and safety programs

3M
Trane
Monsanto
Allied Signal
Hewlett-Packard
Lucent Technologies
North Star Steel • UOP
ARCO Chemical • Infineum
Nalco Chemical • Sentry • Bayer
ExxonMobil Chemical • Bechtel • BHP
Westinghouse • Rohm & Haas • PacifiCorp
Pennsylvania Power and Light • Sentry
Pool Well Services • Wisconsin Electric
Cargill Grain • Wellman • Koch Refining • Hercules
Terumo Cardiovascular Systems • Union Pacific Railroad
Pfizer Pharmaceuticals • Chevron Products • Estee Lauder
Eli Lilly • Ultramar Diamond Shamrock • Leprino Foods
L.L. Bean • Weyerhaeuser • Toyota Motor Manufacturing
ARCO Pipeline • Paxon Polymer • Imperial Oil • Rhone-Poulenc • Searle
Corning Cable Systems • BF Goodrich • Advanced Elastomer Systems
National Park Service • Exxon Coal and Minerals • Cargill Steel
Solutia • East Jordan Iron Works • NORPAC • Southern Fineblanking
Tenneco Packaging • Pike Electric • Square D • Rayonier • Warner Lambert
Lockheed • Honeywell • General Dynamics • Sonopress • Great Northern Paper
Borden Chemical • JEA • Freudenberg • Bristol-Myers Squibb • Johnson & Johnson

Safety Performance Solutions (SPS) advertises these results (www.safetyperformance.com)



NEWMONT
The Gold Company

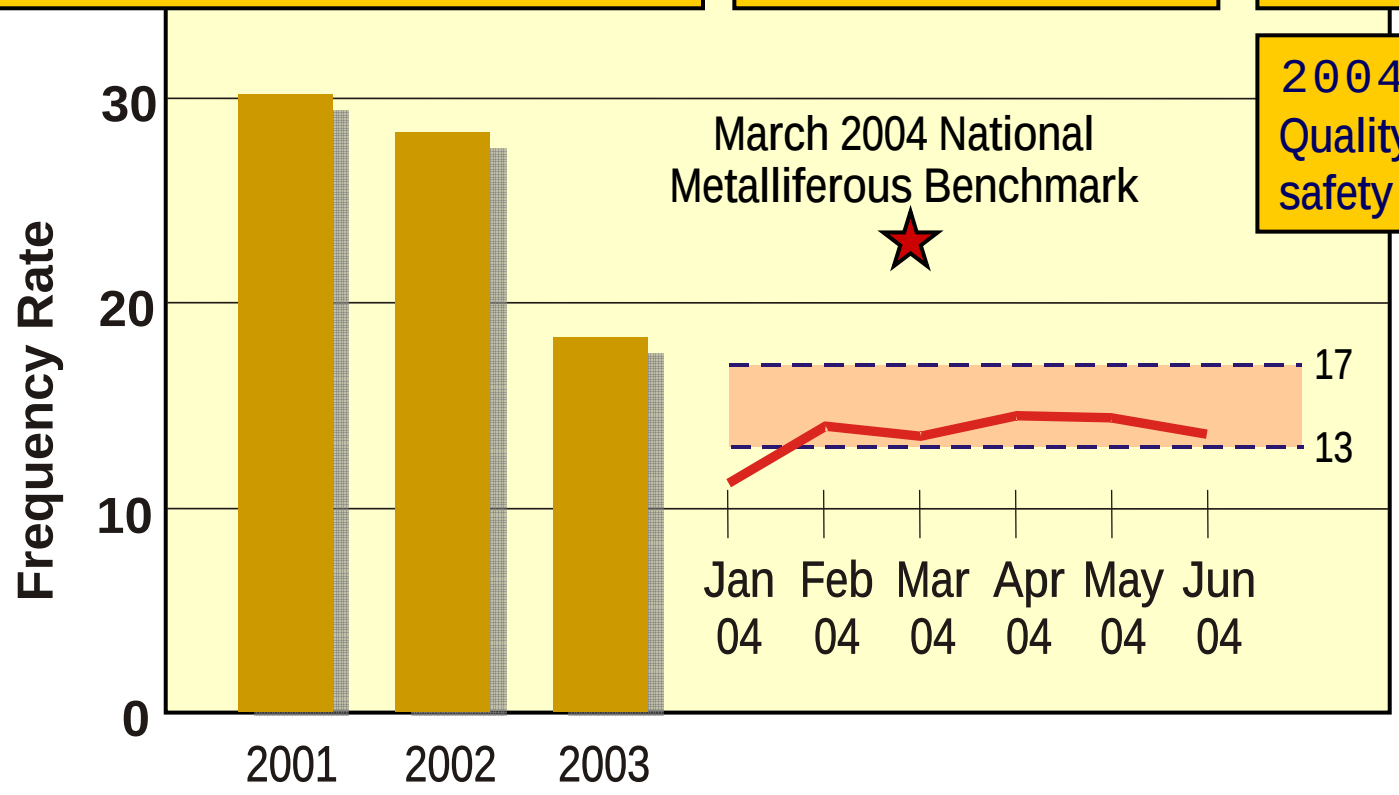
Safety Performance

2001 – Introduction of Newmont Safety System. Safety defined as an individual and organisational value.

2002 – Focus on risk assessment and risk management.

2003 – Focus on Leadership and behaviour.

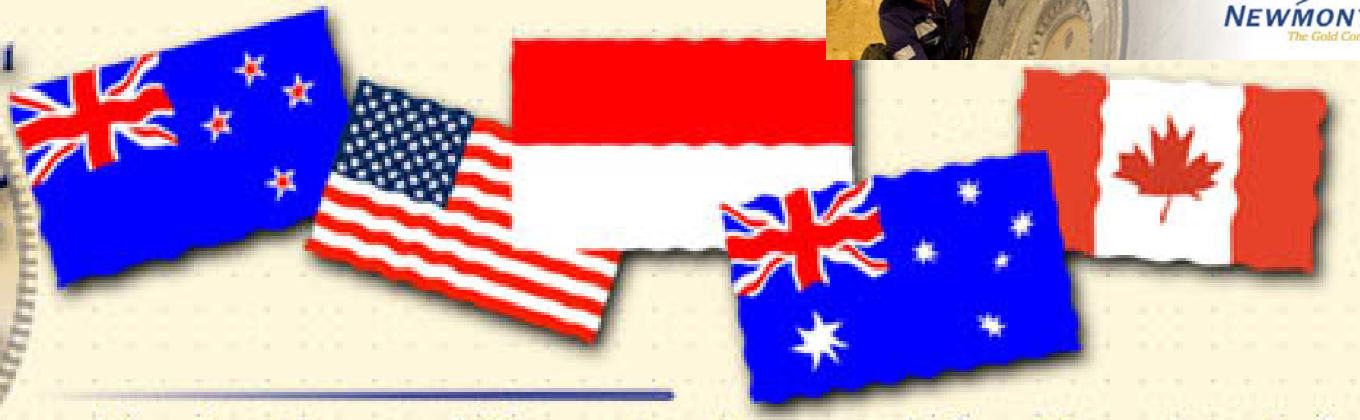
2004 – Focus on Quality of existing safety processes.



TRIFR Performance Range 2004

Smart Menu

Positive Attitude
PASS
Safety System
TM



The Positive and Proactive Approach for Managing Safety

Safety Responsibility

NEWMONT
The Gold Company

FIVE YEARS AGO

- Reactive
- Ad hoc approach to safety management
- Reliance on mine safety regulations
- Focus on lost time injuries
- No formal risk management
- Minimal management leadership

SAFETY SEEN AS A COMPLIANCE ISSUE

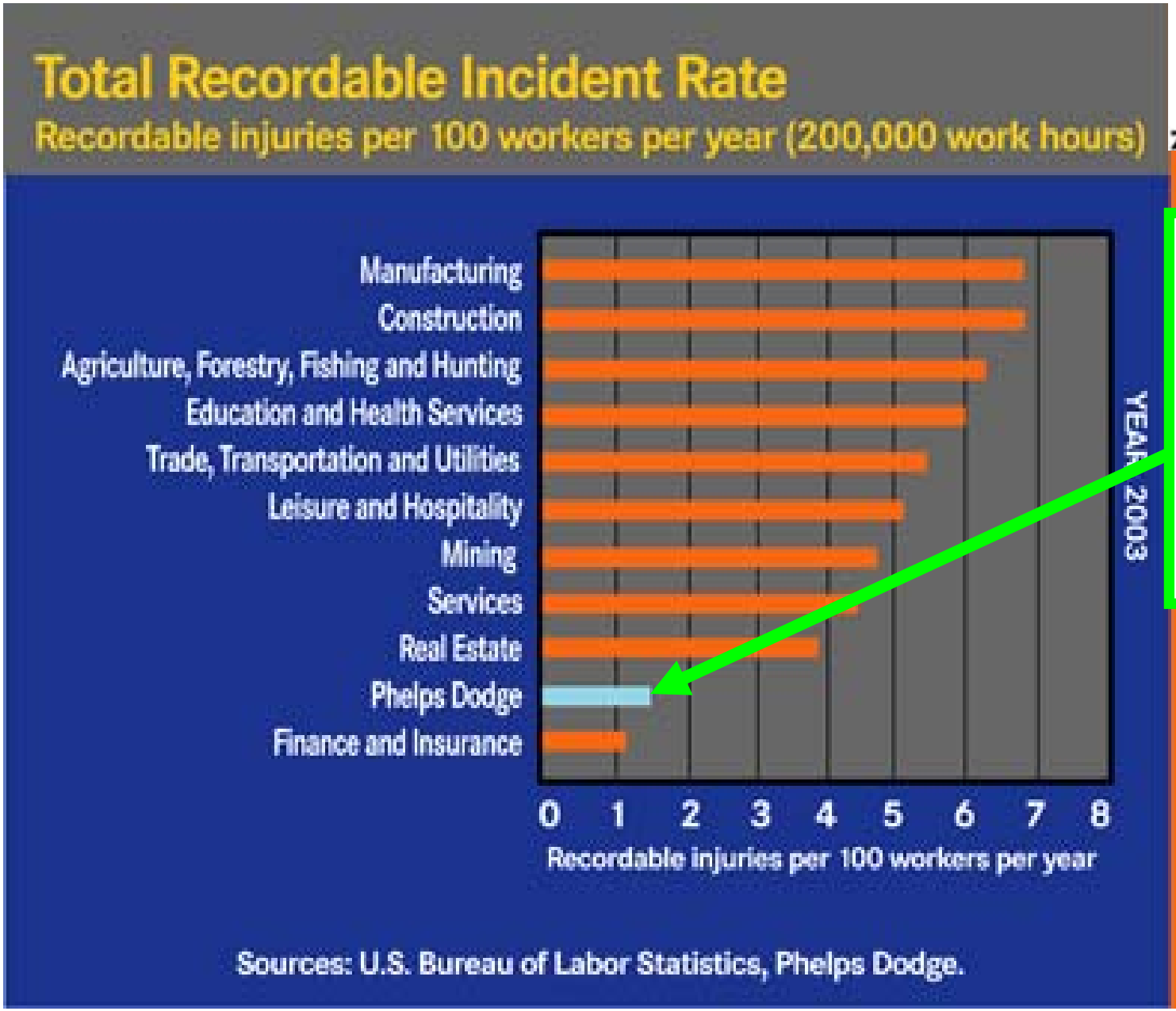
TODAY

- Proactive
- Systems approach to safety management
- Industry and company standards exceed regulations
- Focus on total recordable injuries, near miss incidents and lead metrics
- Application of qualitative and quantitative risk assessments and systematic focus on risk management
- Safety as a personal and company value

BUSINESS EXCELLENCE THROUGH SAFETY

phelps dodge

ZERO AND BEYOND



human factors-based safety and health program results

TEICHERT

Dedicated to
Our Work,
Our Employees, and
Our Communities

Recognized by MSHA for Working 3 Years with No Violations

Human Factors Safety & Health

- **DOES NOT** point fingers
- **DOES** join hands
- **DOES NOT** place blame
- **DOES** break barriers

Most Safety & Health Programs, Initiatives, Stickers, Flyers, Bulletins, etc. Focus on:

- **WHAT** work practice is desired or undesired & how to do it or prevent it
- **WHY** work practices are desired or undesired
- **WHO** is required to perform certain work practices
- **WHEN** certain work practices are to be performed
- **WHERE** certain work practices are to be performed

Human Factors Safety and Health Focuses on

- **HOW** to get miners to make the right decisions and perform safe work practices

- It **answers** the age old question, "**HOW** do we get miners to lock-out & tag-out, not go under unsupported ground, buckle-up their safety belt, etc."

Human Factors Safety and Health Focuses on SOLVING the PERFORMANCE problem.

To do this, Human Factors Safety & Health Zeroes in on

- **The ROOT CAUSES of hazards and unacceptable risks that exist in the mine**

- **Then it says, "Let's form a team of supervisory and non-supervisory miners to *permanently remove and/or mitigate* these hazards and unacceptable risks."**

Human factors safety & health does not have to focus on WHO was at fault to be effective.

Action Plan

- Train managers and miners on SLAM Risks the SMART Way!

- Develop the team or teams to develop the human factors safety and health program
- Give the team or teams the authority to fully implement SLAM Risks the SMART Way!

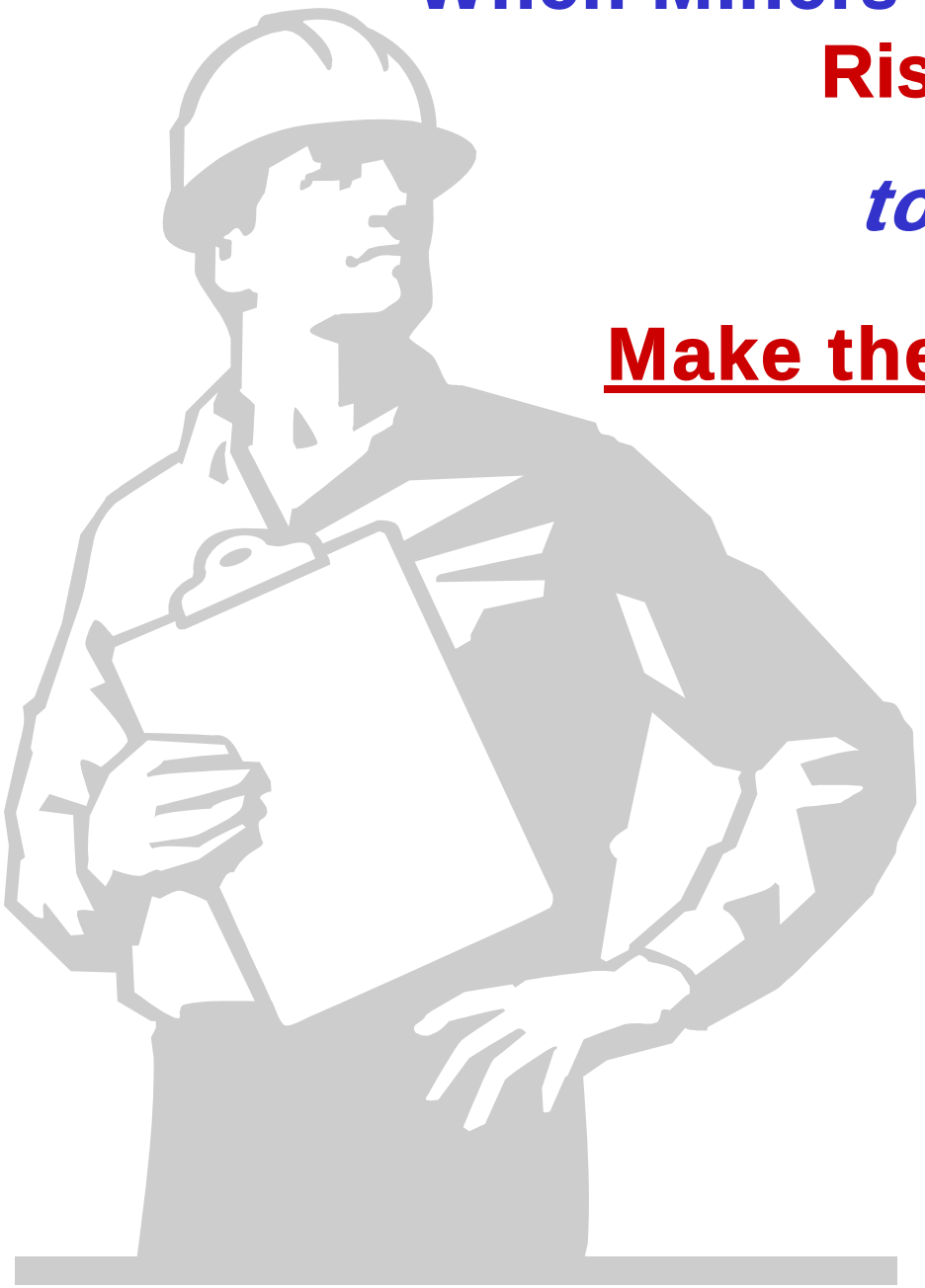
- Establish regular meeting times

Action Plan

- **Closely monitor all steps, techniques, and strategies**

- **Handle smaller safety & health issues first to allow time for the new way of thinking to take root. Then tackle larger issues.**

- **Be patient and give the process time to work. Don't abandon the principles if an unfortunate accident occurs. Safety & health victories will come from leadership, ingenuity, diligence, and hard work.** ***Newmont saw a decrease in accidents of approximately 50% in 12 months or less!***



When Miners & Mine Management are Risk SLAMMERS

together they

<u>Make the RIGHT Decision</u> and…

Questions

Smart Menu