



Assessing Safety Culture in the Mining Industry

Sonja B. Haber, Ph.D.
Human Performance Analysis, Corp.

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Background

- Industrial catastrophes of modern times have led to increased attention on many human performance components
- Safety statistics still attribute between 50 and 90 percent of the causes of industrial accidents to human error
- Human errors associated with industrial accidents are varied in origin BUT are generally part of larger organizational behaviors



Background (continued)

- Safe working environment is impossible without an effective organizational safety culture
- Organizational safety culture consists of the context within which behaviors occur, and the expectations and values perceived to be reinforced by the organization
- A method that allows objective and quantitative measurement of organizational behaviors which impact safety performance is a useful tool



Exercise – Rank Order the Items Below in Terms of Importance in Your Organization

- ___ Thinking in unique and independent ways
- ___ Helping others to grow and develop
- ___ Waiting for others to act first
- ___ Following orders – even when they’re wrong
- ___ Never being the one blamed for a mistake
- ___ Personally taking care of every detail
- ___ Accepting the status quo
- ___ Taking on challenging tasks
- ___ Maintaining one’s personal integrity
- ___ Not “rocking the boat”



Definition of Safety Culture

Safety culture refers to the characteristics of the work environment, such as the values, rules, and common understandings that influence employees' perceptions and attitudes about the importance that the organization places on safety.



Safety Culture Characteristics

- Safety is a clearly recognized value
- Accountability for safety is clear
- Safety is integrated into all activities
- A safety leadership process exists
- Safety culture is learning-driven
- A strong and effective Safety Conscious Work Environment is in place.



Multiple Methods for Behavioral Measurement

- Functional Analysis
- Structured Interviews
- Behavioral Anchored Rating Scales (BARS)
- Behavioral Observations
- Organizational and Safety Culture Survey

Multiple methods are used to assess each organizational behavior evaluated and provide convergent validity to the results.



Safety Culture Assessment - Scope

- Included all functional areas at the Mine and relevant corporate functions of the Company
- On site to administer surveys and to conduct interviews and observations
- Team consisted of 2 consultants from Human Performance Analysis, Corp. and 2 individuals from NIOSH who have extensive experience in underground coal mines



1. Safety is a clearly recognized value

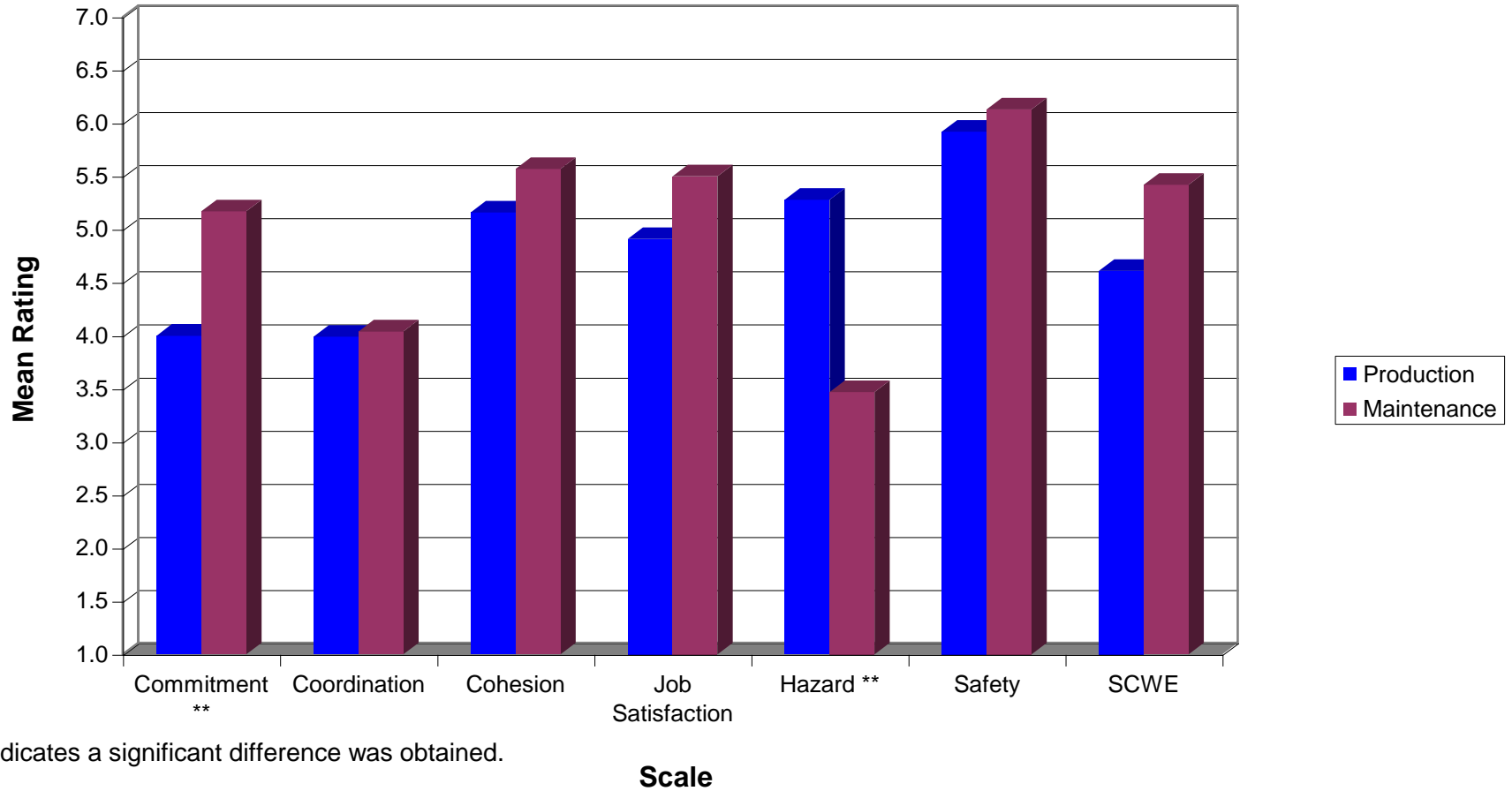
Positive Attributes

- Documentation on safety
- Ways to communicate the value of safety
- Examples of conservative decision-making

Areas for Improvement

- Inconsistent performance on safety-related behaviors
- Certain policies and practices do not demonstrate value of safety over production.

Mean Ratings for Mine Production Versus Maintenance Personnel on Survey Scales





2. Accountability for safety is clear

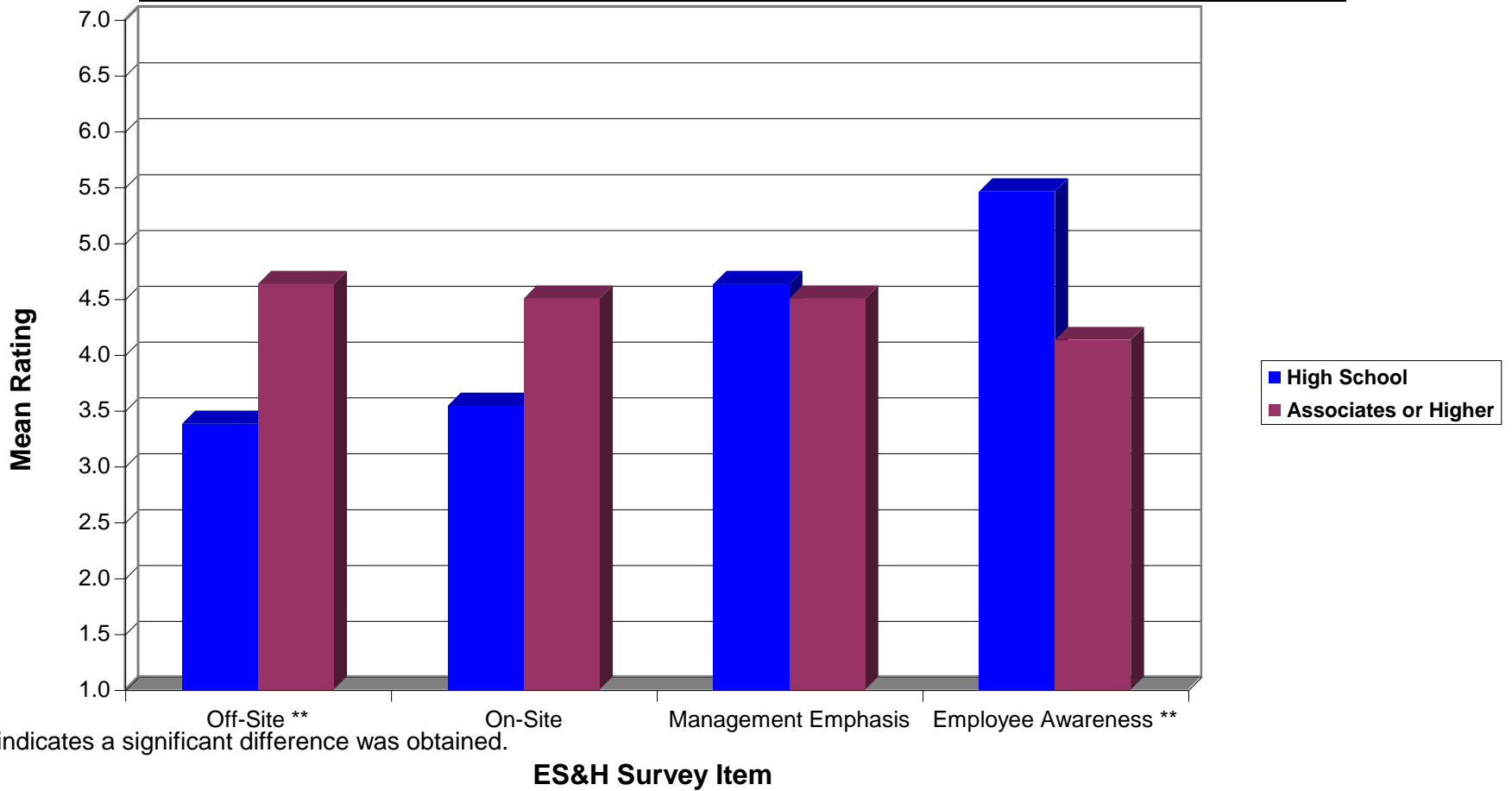
Positive Attributes

- Trained that safety is the personal responsibility of everyone.
- Individuals are held accountable for safety through several programs.

Areas for Improvement

- Standards and expectations for responsibility and accountability for safety are implemented inconsistently.
- Different perceptions of how well informed people are of the risks in their work environment.

Mean Values Based on Educational Level for Mine Personnel on Environmental Safety and Health (ES&H) Questions



** indicates a significant difference was obtained.



3. Safety is integrated into all activities

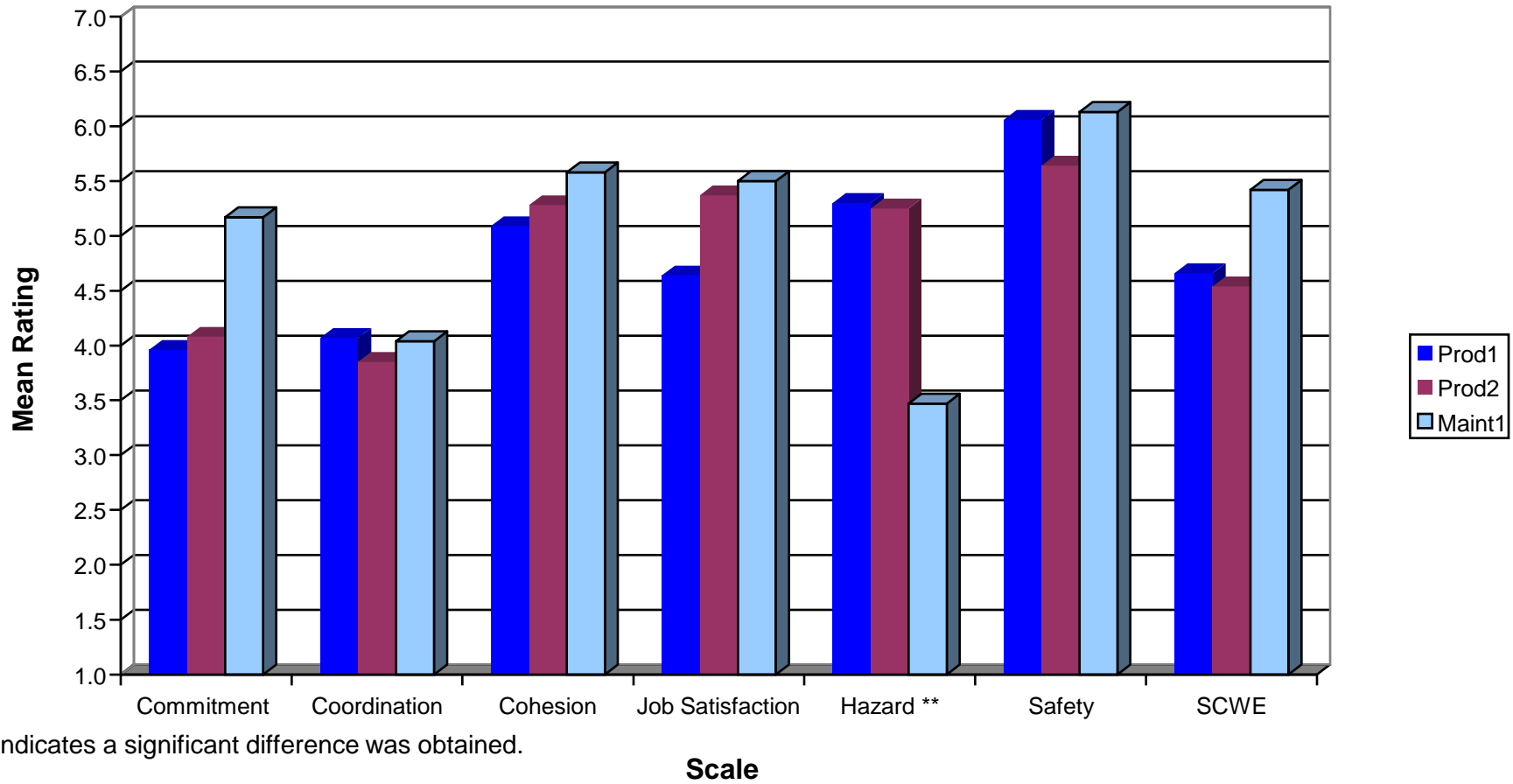
Positive Attributes

- Safety standards exist for several different aspects of mine operations.
- Production Crews perceive the consequences of poor performance on the job significantly more than the Maintenance Crew does.

Areas for Improvement

- Housekeeping and material condition in the Mine needs some attention.
- Need for standard and common processes across company mines.
- Big picture thinking about safety needs some improvement.

Mean Ratings for Mine Crews on Survey Scales



** indicates a significant difference was obtained.



4. A safety leadership process exists

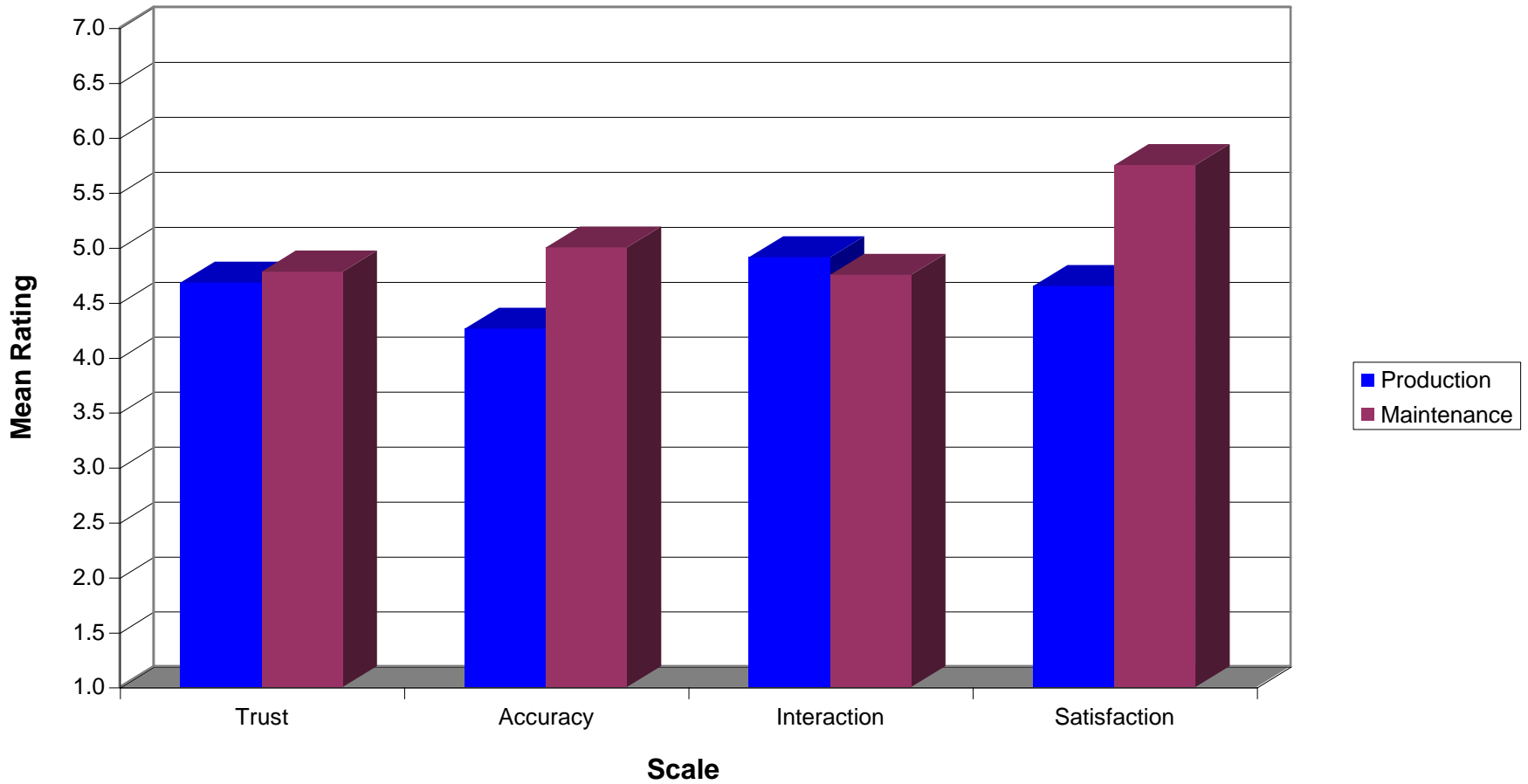
Positive Attributes

- People feel pretty well informed about what is going on at the site.
- The very high response rate for participation in this assessment is a positive indication of leadership's commitment and interest in safety.

Areas for Improvement

- There are some differences across groups in their perceptions of communication.
- There needs to be more organizational/corporate support if truly interested in changing behavior related to safety.

Mean Ratings for Mine Production versus Maintenance on Communication Scales





5. Safety culture is learning driven

Positive Attributes

- Information internal and external to the Mine is collected and talked about.
- Most individuals believe that they can identify problems and are encouraged to do so through their line management.
- Training activities are perceived to be pretty good by most individuals.

Areas for Improvement

- There is the perception that the organization does not learn well from its mistakes.
- The organization has created some barriers to reporting mistakes.
- Some training issues need attention.



6. A process for establishing a strong and effective SCWE is in place

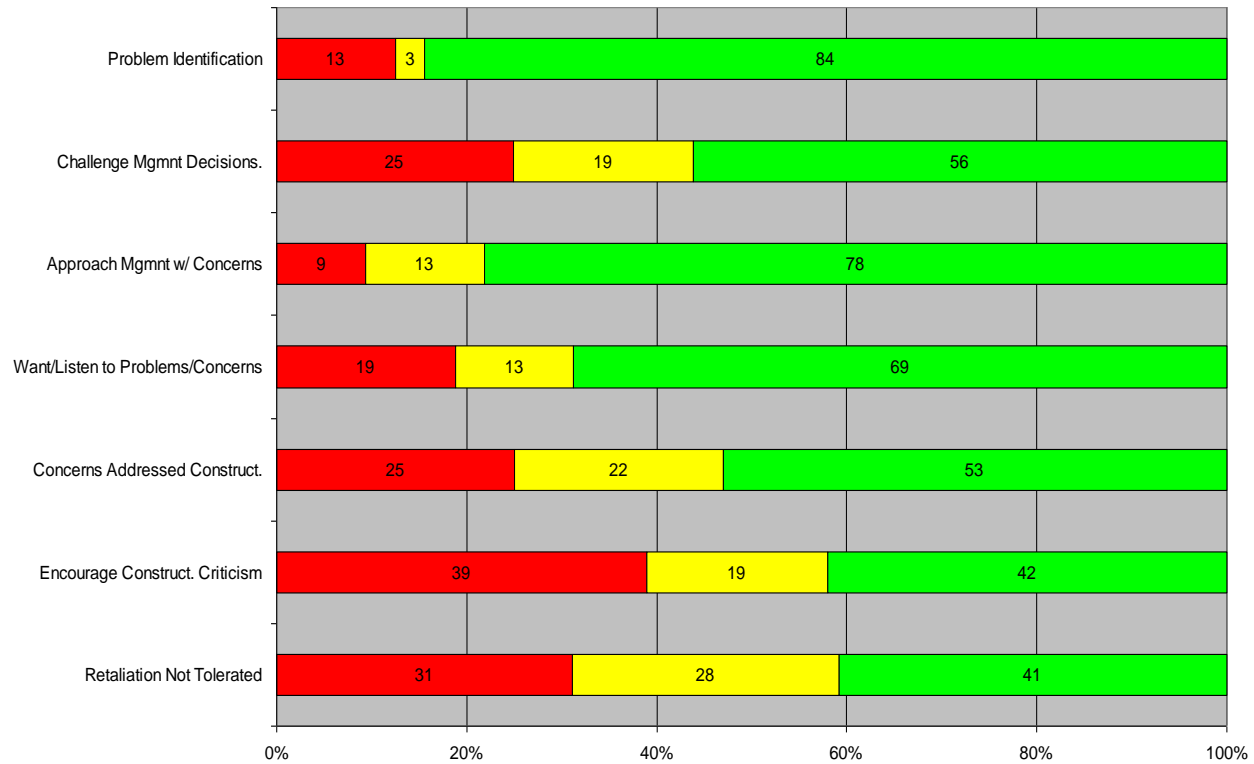
Positive Attributes

- A hotline for raising safety concerns is available to all employees through the Mine Safety and Health Administration.
- Most individuals (84%) expressed the belief that they are responsible for identifying problems.

Areas for Improvement

- Some better ways are needed to create a more open and accepting environment.
- Individuals should be encouraged to question and discuss issues as they arise.

Overall Responses to SCWE Questions





Conclusions from Mine Assessment

Feasibility and Usefulness of Methodology

- Implemented without difficulties/Lessons learned

Understanding and Defining Existing Safety Culture

- Initiatives and behaviors that facilitate a positive safety culture do exist.
- Currently a compliance based culture

Recommendations for the Mine

- Leadership with continuous improvement and accountability
- Enhanced organizational learning to be more proactive



Implications for the Mining Industry

- Organizational safety culture is definable, assessable, and manageable
- Methods are available for the diagnosis, intervention and measurement of behaviors important to safety culture
- Relationship between safety culture and ‘safety conscious work environment’ is inherent in the behaviors important to both
- Strategies can be implemented to ensure organizational focus on development and maintenance of behaviors important to safety culture