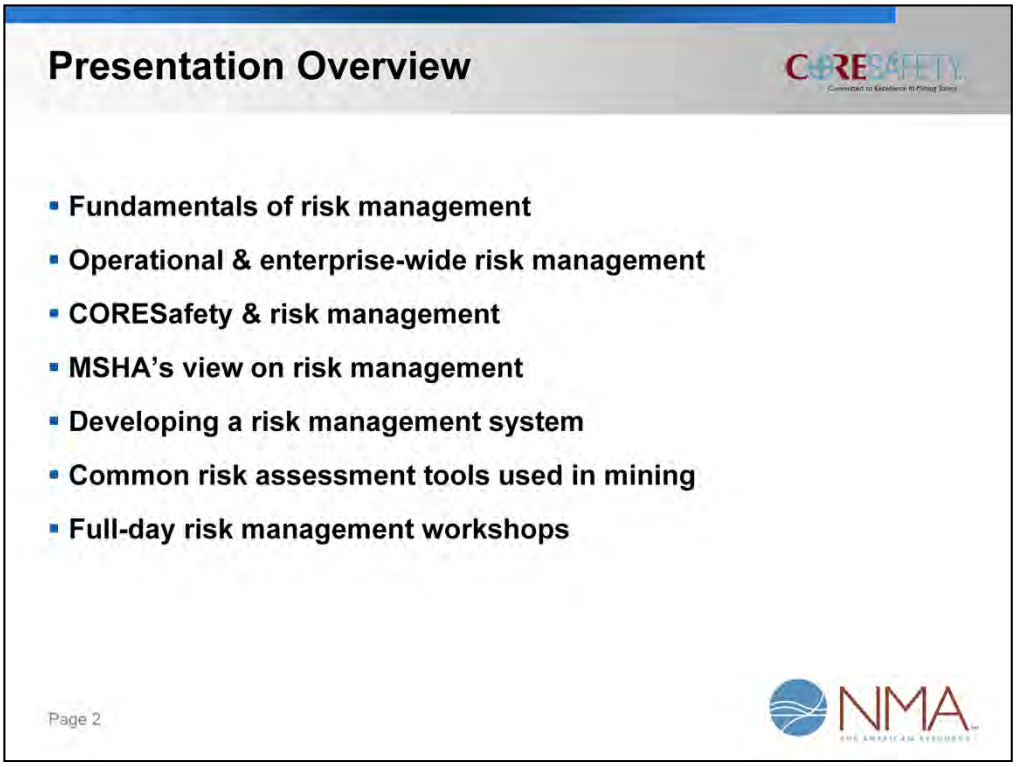

Welcome everyone to this NMA webinar on Risk Management. We are pleased to bring you this education program in support of the **CORE**Safety® initiative.

In the next hour, we will review the key principles of risk management -- a relatively new approach for addressing mining hazards, but one that has already had a long history in other industries and in the mining industry in other countries.

I'd now like to introduce Tom Hethmon of the University of Utah who will take us through the program.

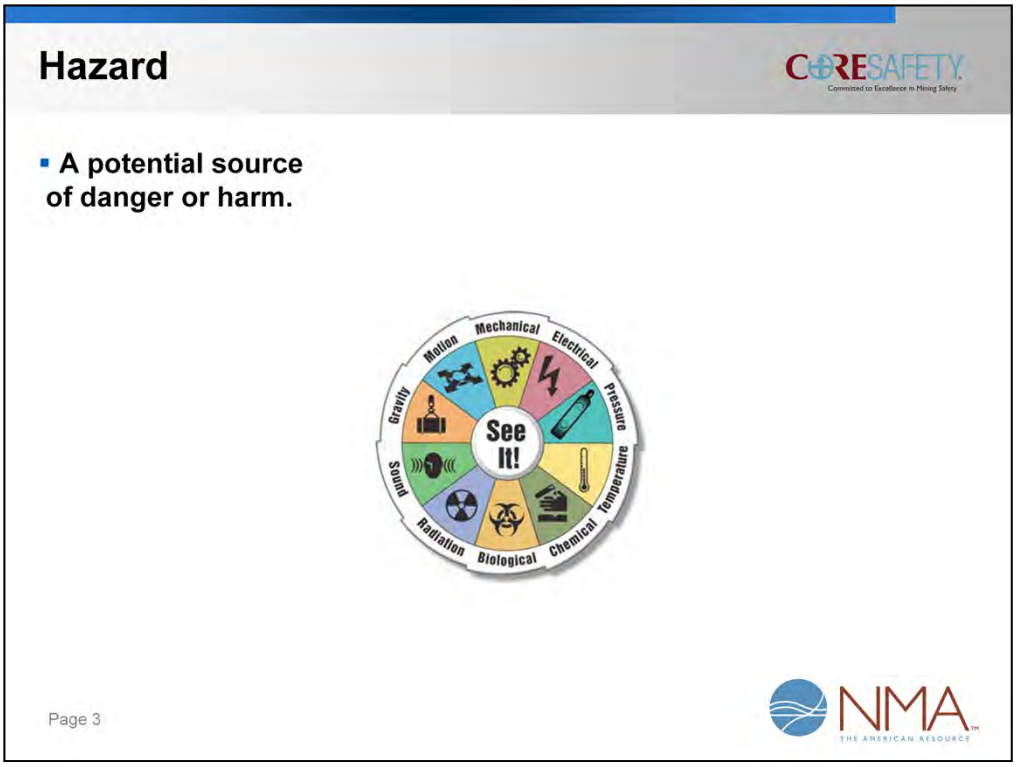



Good morning ladies and gentlemen. Thanks for taking the time to participate in the webinar. As we move through the material this morning, we ask you to hold your questions and comments until the end to ensure we get through all the material in the alloted time.

We'll begin with a review of the fundamental concepts and terminology associated with risk management and then discuss a form of risk management referred to as 'enterprise-wide risk management' for which many of your companies are already conducting.

We'll highlight how risk management relates to **CORE**Safety and then briefly cover MSHA's approach to this subject, as we understand it.

From there we'll discuss approaches that some mining companies have taken to develop risk management systems including what we see as the most applicable risk assessment techniques for mining.




At its core, risk management is about the comprehensive and systematic management of hazards by understanding their risks and apply appropriate controls based on those risk characteristics. A hazard is anything with the potential to do harm or damage in the mining environment.

If you're new to the topic, that description should sound a lot like what mine engineers, managers, safety professionals and miners already do today. The difference is in the systematic and structured way in which risk management is conducted.

The process begins with hazard identification. A core aspect of effective risk management is to look at all hazards associated with a mine, process or work task. For many mining personnel, they can easily identify very obvious, usually high-risk, hazards.

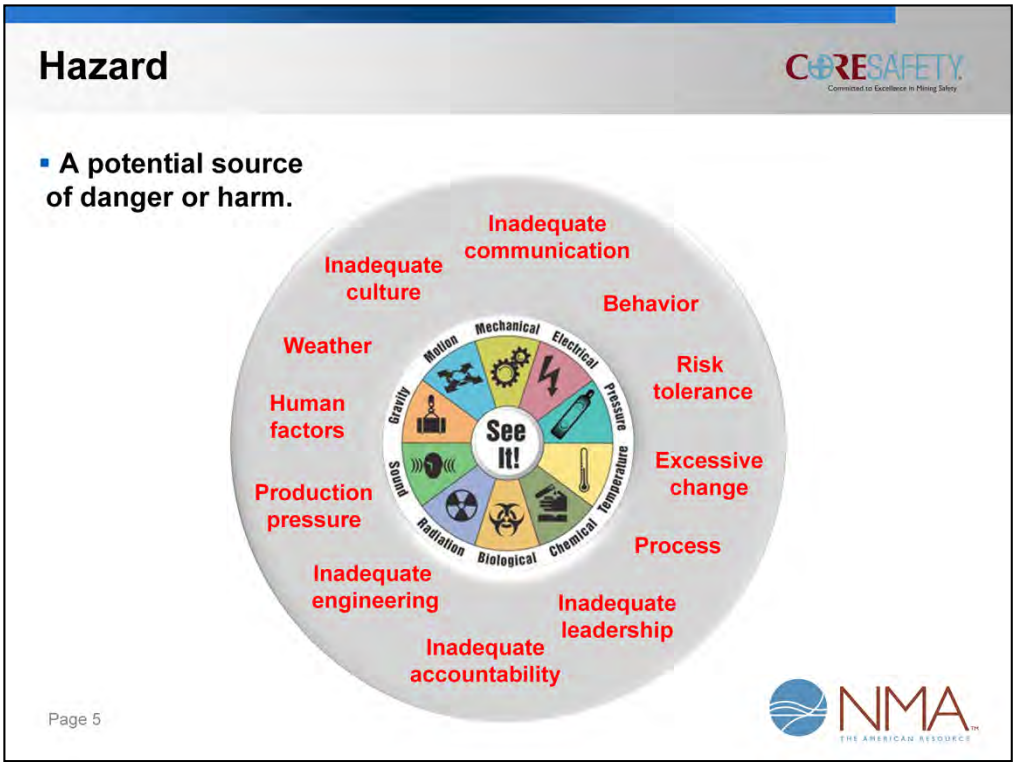
However, how many of us have gone through an experience in which there is a mining incident after after-the-fact people say, "We should have seen that coming."

One effective technique that is used is to look at hazards in terms of their form of energy of which there is at least 10 in mining: radiation, sound (or acoustical), gravity, motion, mechanical, electrical, pressure, temperature, chemical and biological. And of course each of these sources can be either potential or kinetic, except motion which by definition is kinetic.


While this is not the only way to classify and inventory hazards, this approach can help you to see how they impact miners and equipment by looking for the potential point of energy transfer between the person and the source of energy, or the source or energy and a sensitive point of contact like equipment, utilities, etc. You can also think of these sources of energy as potential 'points of pain'.

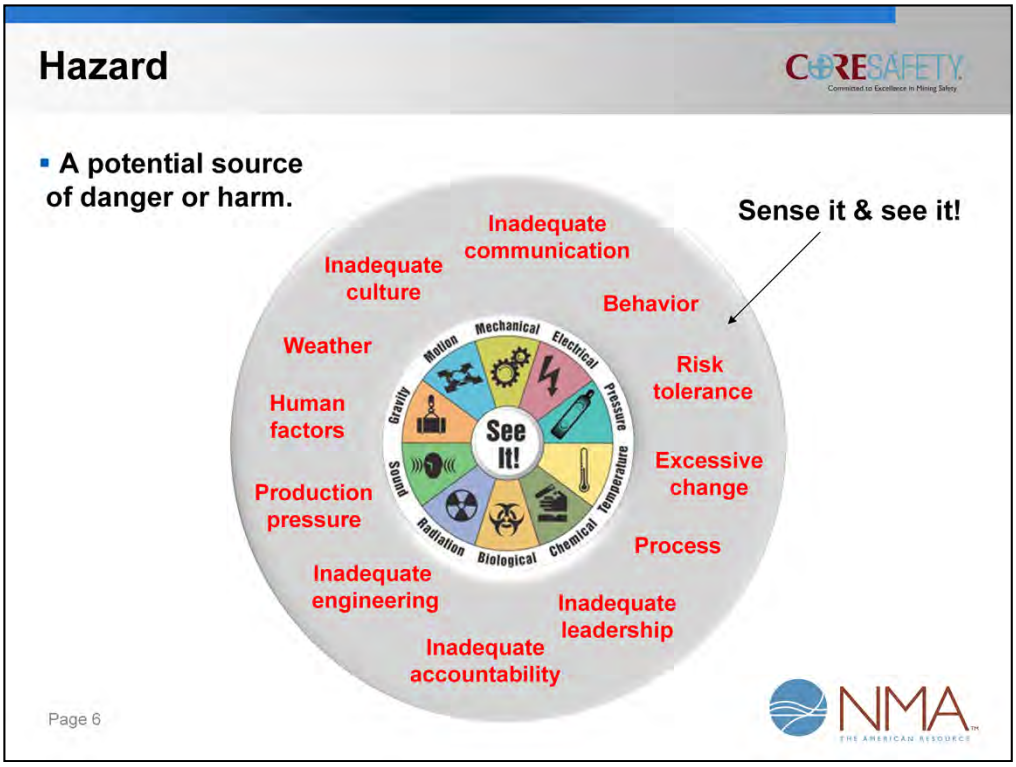
This approach also helps you to begin thinking about the best form of control to apply beginning with the design of a mine on through to operations. We should be able to see and/or sense these hazards and their potential.

Obviously, this exercise is not limited to those who conduct risk management, but must be known to all managers and miners with the potential for exposure.




However, as we learn more about what causes mining incidents, we understand that they are not limited to just the form of risk that causes injury, fatal or otherwise, or occupational illness, we also need to understand the role of the organization and its culture if we are to truly eliminate mine fatalities as we aspire to do through the **CORE**Safety goal of 0:50:5, or whatever your company's performance goal is.

This means we must be aware of the organizational and individual hazards associated with change, production pressures, at risk behavior, ineffective accountability, the mining process, human factors that can lead to at-risk behavior, and others.




While physical hazards are much easier to be aware of and “see”, it is no less important to see or sense these other organizational hazards. Is your organization  able to do this? You may need a telescope or a microscope to see all the mining hazards that have sources of energy, but you are just as likely to need a mirror to examine organizational culture, leadership and behavior as significant contributing factors.


If we stop and think what it is that is unique about mining risk versus risk in other industries, there are five characteristics that can help in the hazard identification and risk assessment process:

1) mining is constantly changing. It is dynamic and the hazards are too. The underground mining face or surface shovel pit can change often by the hour as can haulage roads and/or the conditions of the roof, etc.

## The Nature of Mining Risk

- Mining risk is highly scalable -- everything is bigger.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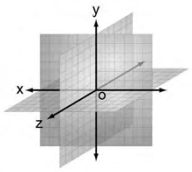
2) It is very scalable, that is, as we seek to leverage economies of scale, equipment gets larger, tools get larger, mines get larger, and this impacts on risk.

## The Nature of Mining Risk

- Mining risk is proximal & three dimensional -- x, y & z.

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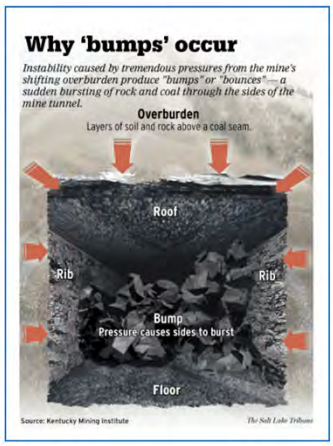
3) Miners often need to be close to hazards, especially in underground operations, in order to extract material. Autonomous equipment is beginning to change that dynamic, but may also introduce new hazards and risks. Can you think of another industry where this is true except maybe construction, commercial fisheries or forestry -- not coincidentally industries with some of the highest injury/fatality rates?

## The Nature of Mining Risk

- Mining risk is based on an imperfect understanding of geology.

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4) Unlike other industries, our assessment of risk is based on an imperfect understanding of geology and rock mechanics. We learn more every year, but we must operate without knowing exactly how the geology will behave in all circumstances. This is a major contributor to risk and the identification and selection of appropriate controls.

## The Nature of Mining Risk

- The size, depth, volume, speed, diversity, complexity of mining risks are far more significant today than in the 1970's when the Mine Safety & Health Act was promulgated.

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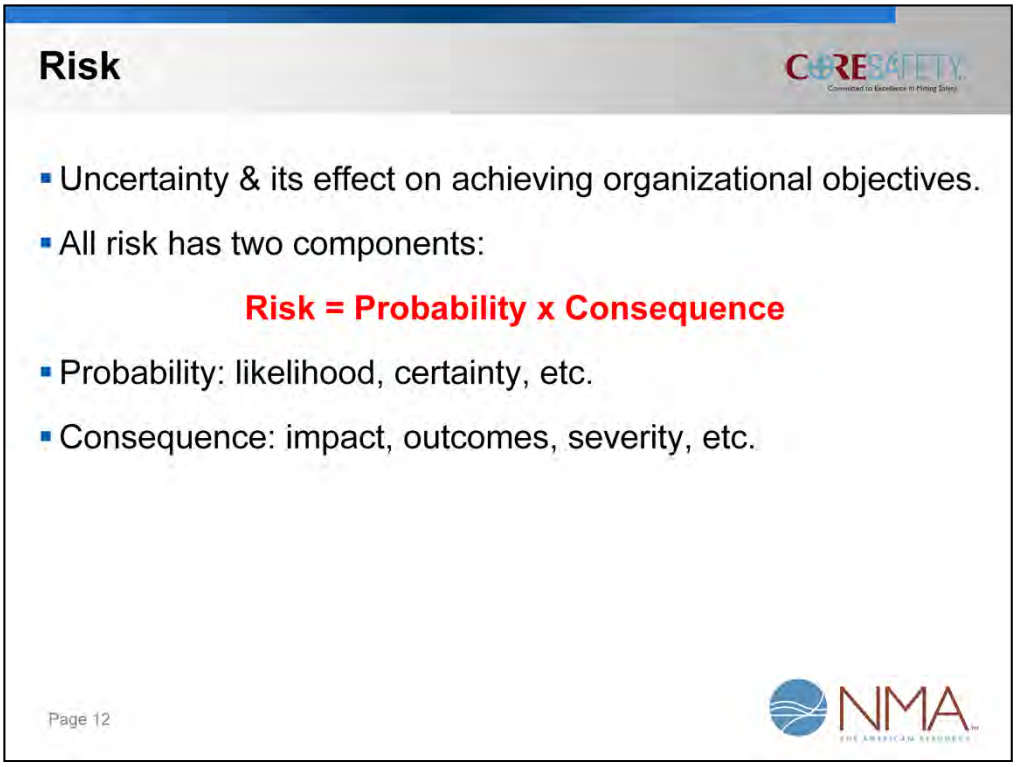
5) Lastly, and perhaps most importantly in relation to MSHA regulation, the industry continues to grow, change and accept more risk in part because of the requirement for more mined products. Most of the ripe (easy to get at) fruit is gone and we must look farther afield to find it and extract it.




Once we know our hazards we can assess their risks. While hazard and risk are terms that are sometimes used interchangeably, they are different. If hazard is the potential to do harm, risk is the uncertainty associated with that harm and its effect.

It is composed of two components: 1) the potential that harm will occur; and 2) the severity or consequences of the harm.

## Risk

- Uncertainty & its effect on achieving organizational objectives.
- Composed of two components: probability + consequence.

**Risk = Probability x Consequence**

- Probability: likelihood, certainty, etc.
- Consequence: impact, outcomes, severity, etc.

**Risk = Probability x Consequence x Multiplier**



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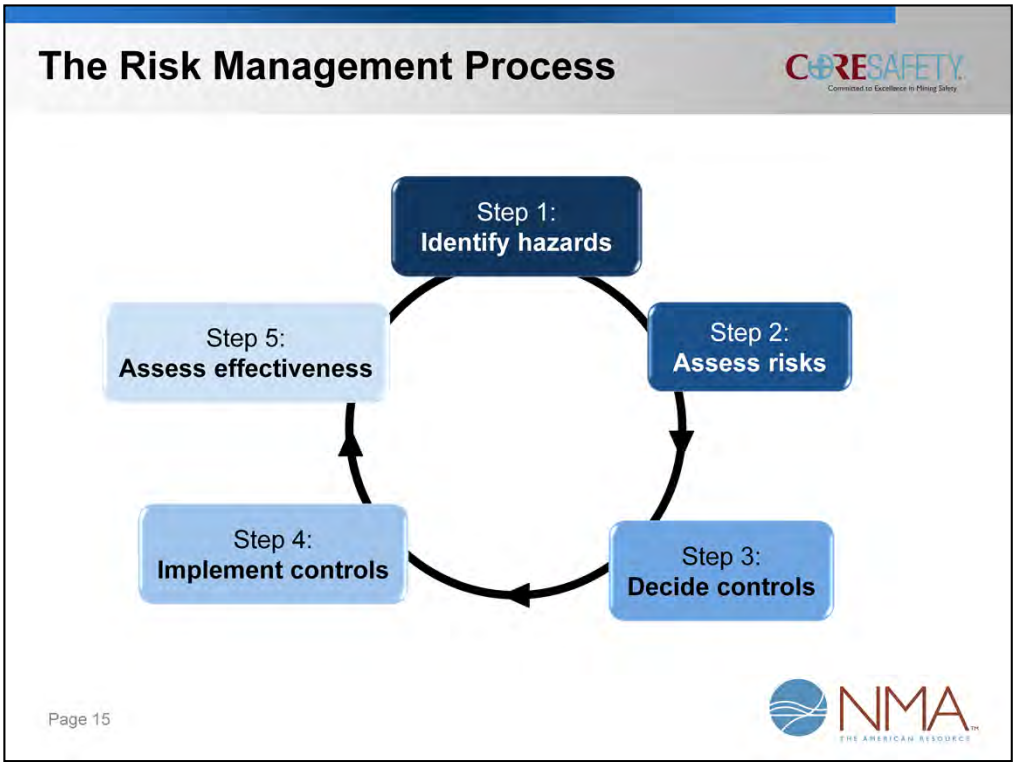
We are interested not only in the probability of a hazard transforming or expressing itself as real harm, and the severity or outcome of that harm, but how broad the effect will be – how many miners, community members, pieces of mining equipment, etc. will be impacted? We can call this a multiplier effect. Our risk goes up if the same hazard affects 10 miners versus one.

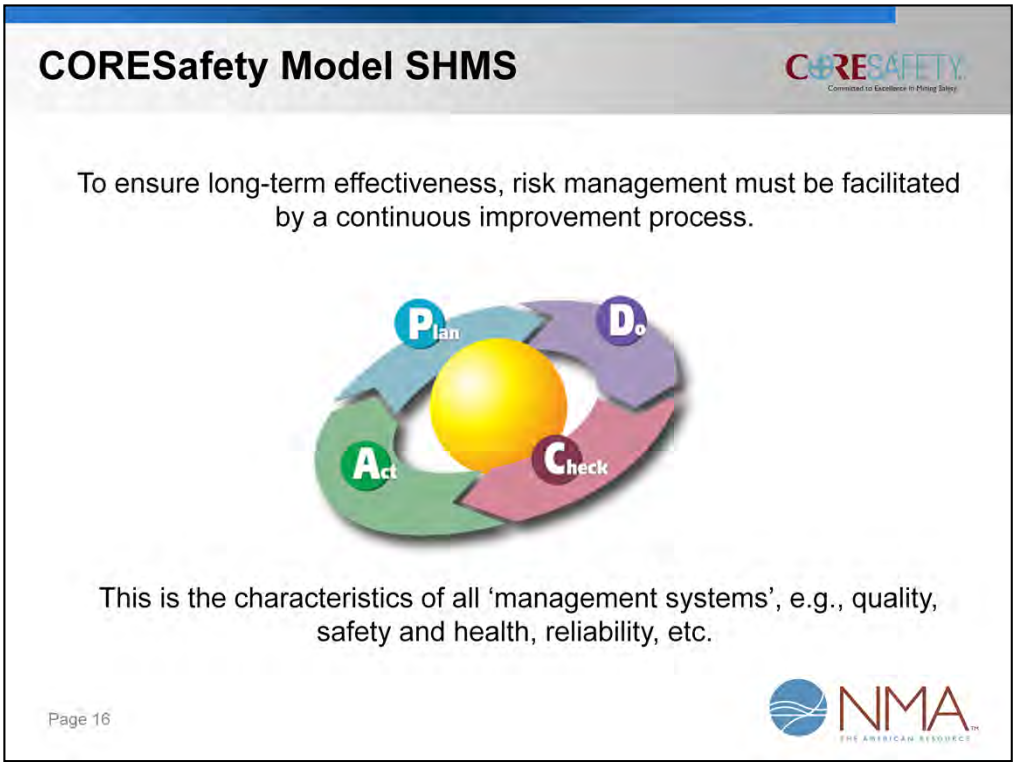

If you're new to risk management you might think this all seems very obvious or simple and it just has to do with mine safety. In fact, risk management is a very broad philosophy and process that is applied, or inadequately applied, anywhere hazard exists. Our history as a country and an industry is full of examples of where those who were responsible for doing risk management failed to properly understand both hazard and especially the risk and that have have truly catastrophic impacts on our society.

If you want to reap the many benefits of risk management, we must not only change our approach to hazards and controls, but our thinking about risk. To get it right, it is not enough to do risk management, we must become risk managers.




The process of risk management looks like this:

- First you identify the hazards as comprehensively and systematically as possible.
- Next you assess the risk as comprehensively and systematically as possible.
- Once you understand or have an educated estimate of the probability and consequences, you must decide how to control those hazards.
- Step four is planning and implementing the controls. Sometimes this is very simple and quick, but sometimes it require a significant amount of capital and time.
- The last step, and certainly the step that is weakest in most mining companies is the process of verifying that the controls you select to reduce the risk of hazards are working as designed.
- And I hope you appreciate that the quality of doing any one step or all these steps is improved if you include a wide cross section of those people who understand or are affected by mining risk. Don't leave this just to engineers and safety professionals, but include miners and other stakeholders whenever possible.



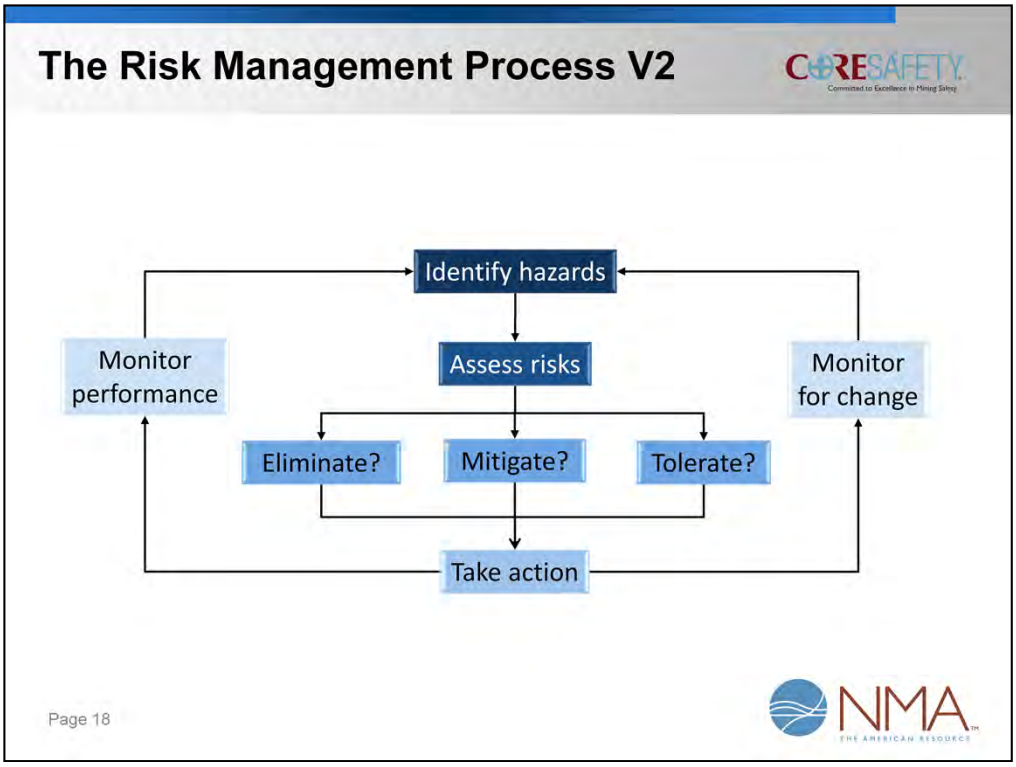

Risk management is not something that happens just once. It's an ongoing core competency of safe companies in any industry. To ensure the process continually improves regardless of where you start, it is important to apply a continuous improvement mechanism like the Plan Do Check Act cycle, also know as the Deming Cycle.

This suggests you not only conduct risk assessment and risk management, but you and your management team assess and review how well it is working as a process or system.

If you are having injuries and property damage that you don't expect to, something is wrong with your risk management process. You need to look at both the way you are controlling hazards, but the effectiveness of your risk management practices.

It is important to remember that risk management can be applied to any kind of mining hazard: geology, procurement, labor relations, behavior, weather, etc.


Applied together, continually improving risk management looks like this. Some steps in the process are helping to plan and do while others are checking and correcting and acting to ensure you are getting the outcomes you expect.




Here is another way of looking at the same process.

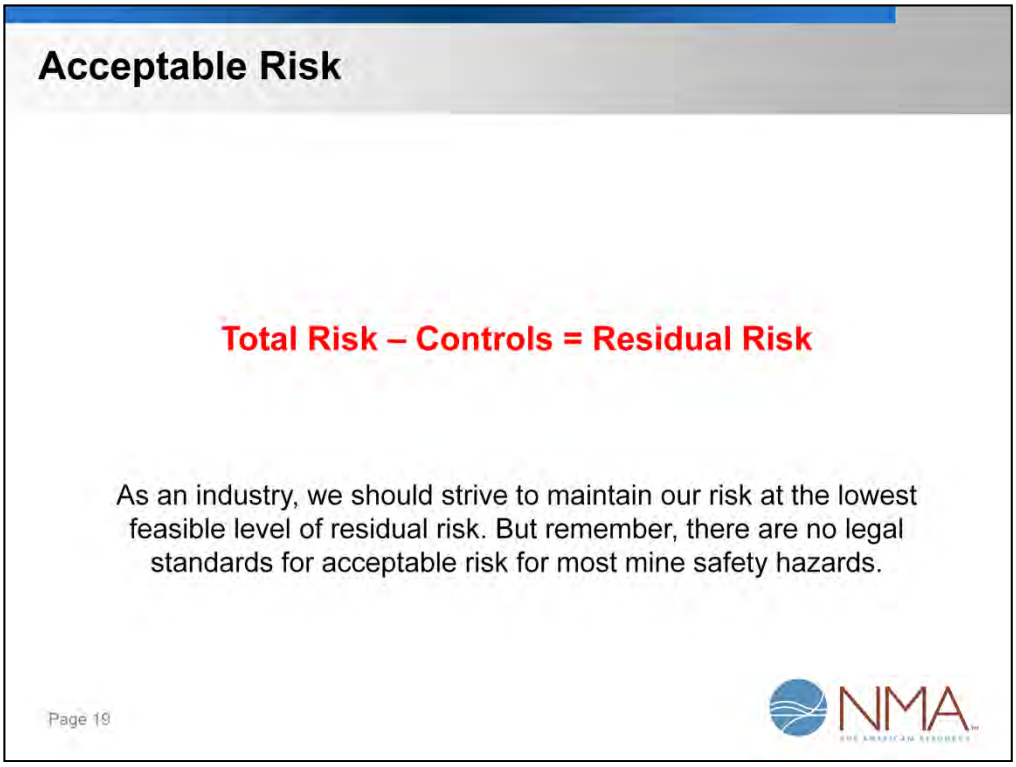
You identify the hazards, assess the risks and then must decide what to do about the risk. Some may think the goal is always risk elimination. While that is the very highest level of control you can achieve, it is not always realistic.

In fact, we can't eliminate all mining risk, only certain hazards. The goal is to manage risk to the most acceptable level possible.

For those participating in **CORE**Safety, the goal is to reduce the risk of fatalities to as close to zero as possible and significantly reduce the risk of other types of injury.

Beyond taking action, we must assess the effectiveness of the controls and focus on change management.

Change management is the understanding of when any change in your mine affects you assumptions and actions associated with hazard control. This is another reason risk management is a perpetual process and is as much a change in our thinking about risk as it is in what we do.

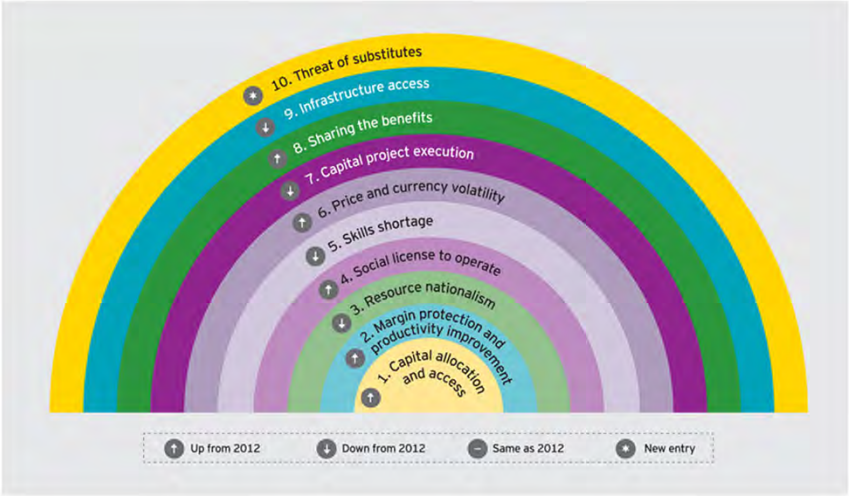



So what is the appropriate level of acceptable risk? There is no absolute answer to that question except that it should be as low as reasonably achievable.

Some mining stakeholder will say we should eliminate mining risks. This is a noble and appropriate ambition; however, it is generally unrealistic. This is a matter of **managing** risk. That is, not allowing risk to have unacceptable impacts on our people, our assets, our communities, our environment, and our reputation.

When we think about acceptable risk we are not referring to total risk as being is equivalent to adding all the risk in our mine or mines. We are interested in the residual risk – the risk that is left over once we apply controls to our total risk.

## Ernst & Young Global Survey of Mining Risk

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By now, I'm sure you appreciate that risk management is not just about mine safety. It applies to anything that is a hazard in mining – anything with the potential to do harm. That includes the entire process of mining from exploration to development, operations and through to mine closure.

Many people study and follow the changing trends associated with the global mining risk. This graphic shows the outcome of a study conducted by the consulting company Ernst and Young that asked global mining leaders to rank the most important risks affecting the mining industry today. They are ranked from one to ten.

## Ernst & Young Global Survey of Mining Risk


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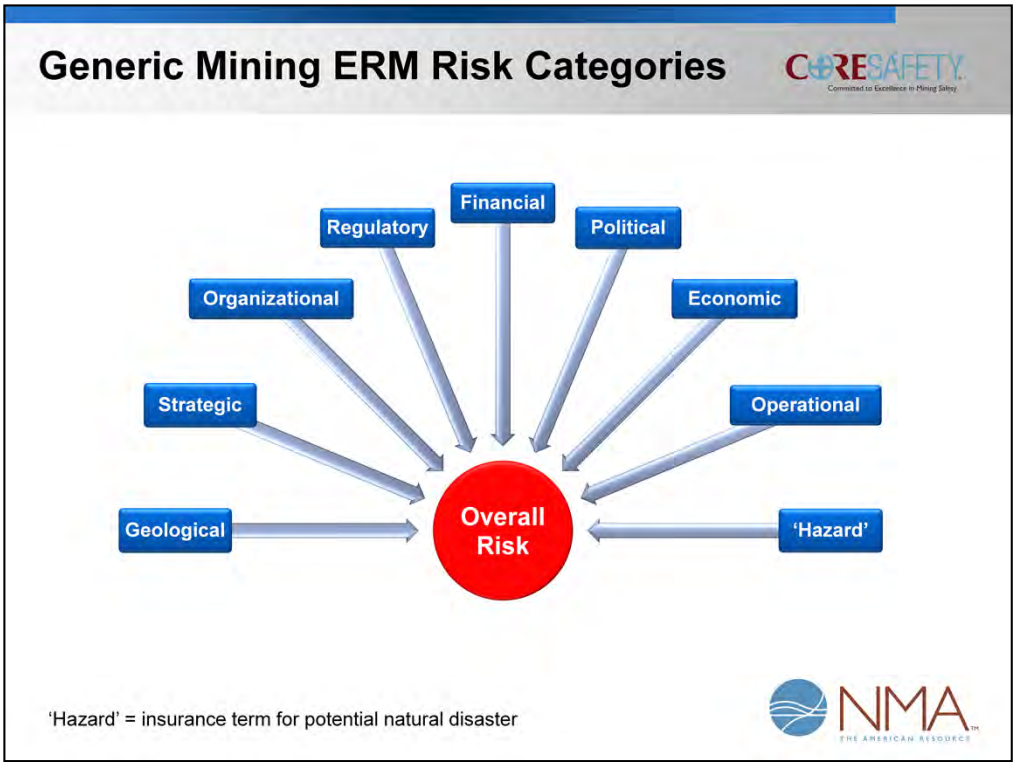
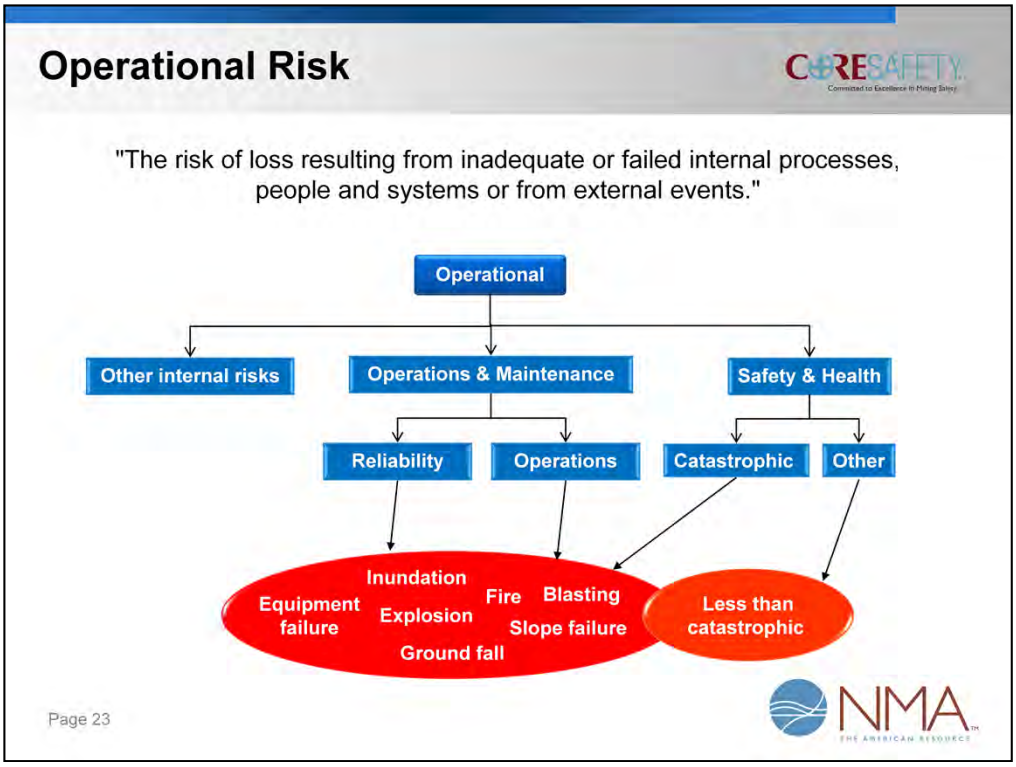
As you can see, in 2013, the idea of the 'social license to operate' – society's tolerance of mining, has risen to a very high position. For many of us, social license to operate includes safety and health management and performance.

As a reminder, risk management is about how a mining company is run and not just about safety. It should start at the top of the organization and go down to the newest employee with continuity and intent.




If you aren't already aware, ask your senior management about your company's approach to enterprise wide risk management (ERM) as it will give you insight into what they consider important in terms of significant risk, including safety.

Typically, ERM reviews include a number of issues that are potential risks to your entire business: geological, strategic, organizational, regulatory, financial, political, economic, operational and  hazard – or the potential for natural disasters such as floods, earthquakes and tornadoes.



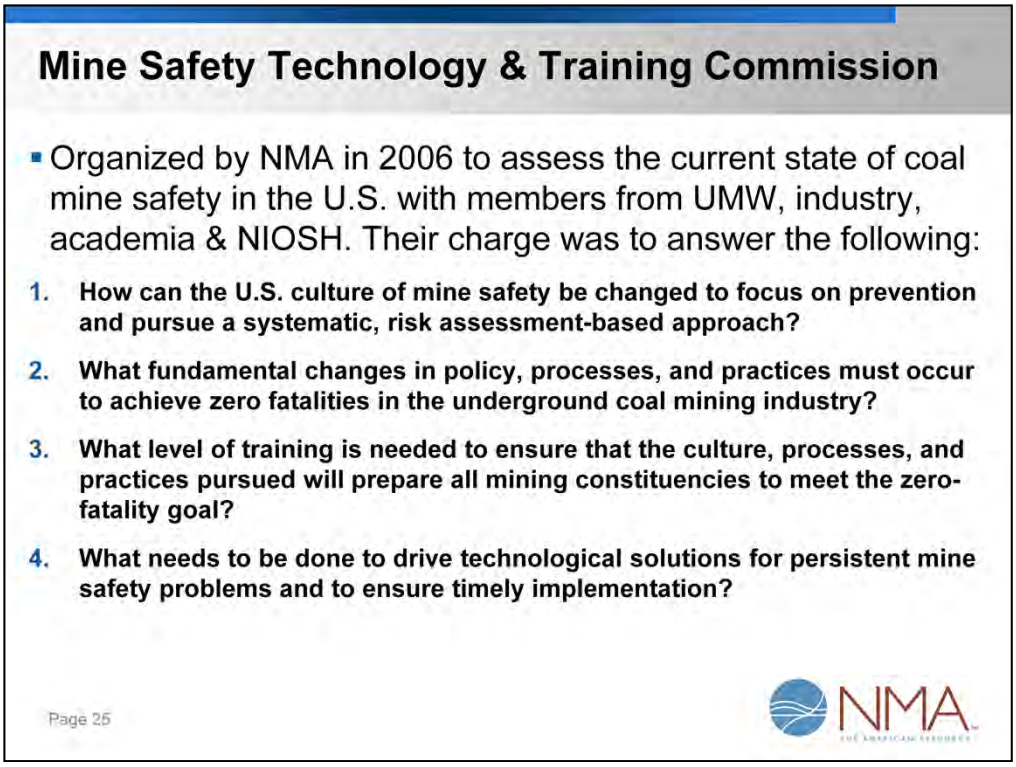

In all mining companies, one operational risk is safety and health. Traditionally many people have viewed safety and health as something independent of operations and maintenance activities. That is, safety was responsible for safety and operations was responsible for operations. Today, those lines of distinction are going or gone and we know that the potential for safety risk comes specifically from operations (including development) and maintenance activities. That is, operational risk management may involve and affect many different people, but it is a line function.

As such, there are two types of risk that we need to be concerned with: 1) catastrophic risk in which there is a probability for one or more fatalities and/or massive damage to mine equipment or infrastructure with or without impacts to employees; and 2) all other types of risks that are less than ‘catastrophic’.


It's important to note at this point that risk doesn't exist in a vacuum. It's not an inherent quality like the specific gravity of gold or copper or the BTU value of different types of coal. Instead, mining risk is like the weather: it can be made better or worse by many factors, including your risk culture. Every mine and every mining company has a risk culture. You can't see it but it influences your workforce and your risk profile all day every day – even while you're participating in this webinar.

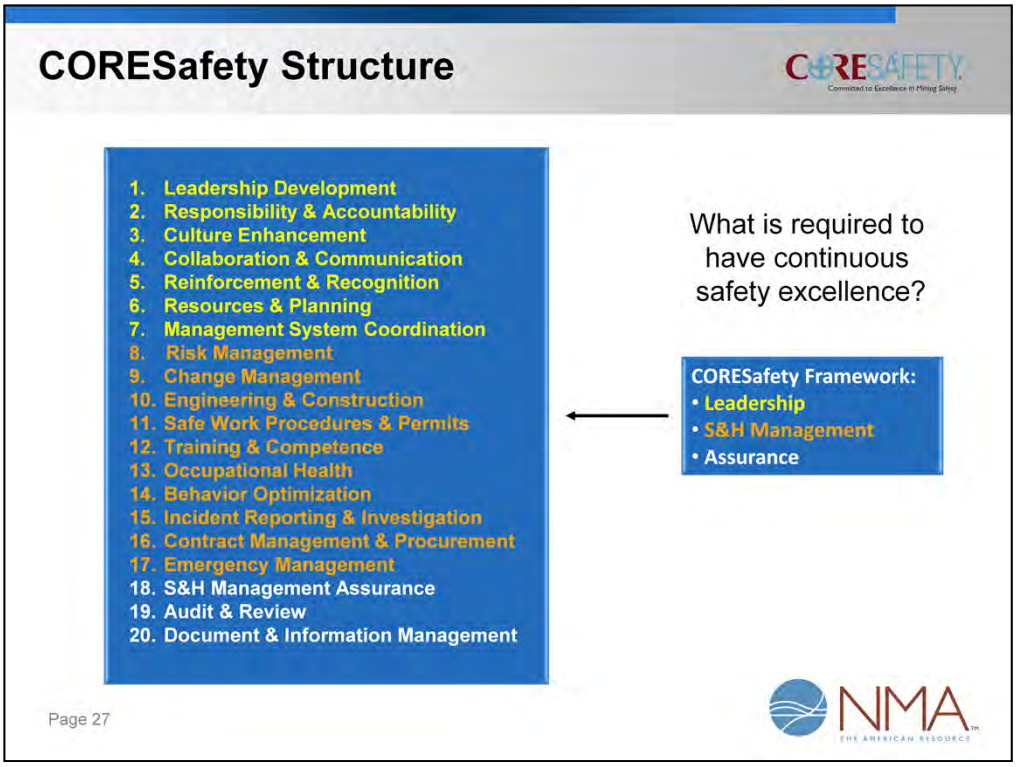
Risk culture is a reflection of your mine's or company's tolerance of risk, structure and systems used to avoid bad things from happening, management's behavior (both good and bad) and the degree to which your company controls hazard through effective engineering, procedures, etc.

One of the less controllable influences in your company's risk culture is employee behavior. If you do an excellent job of controlling hazard, but employees defeat those controls for whatever reason, your risk increases. Likewise, if you do invest in good engineering and process controls, your employees may be able to limit risk also based on how they behave.

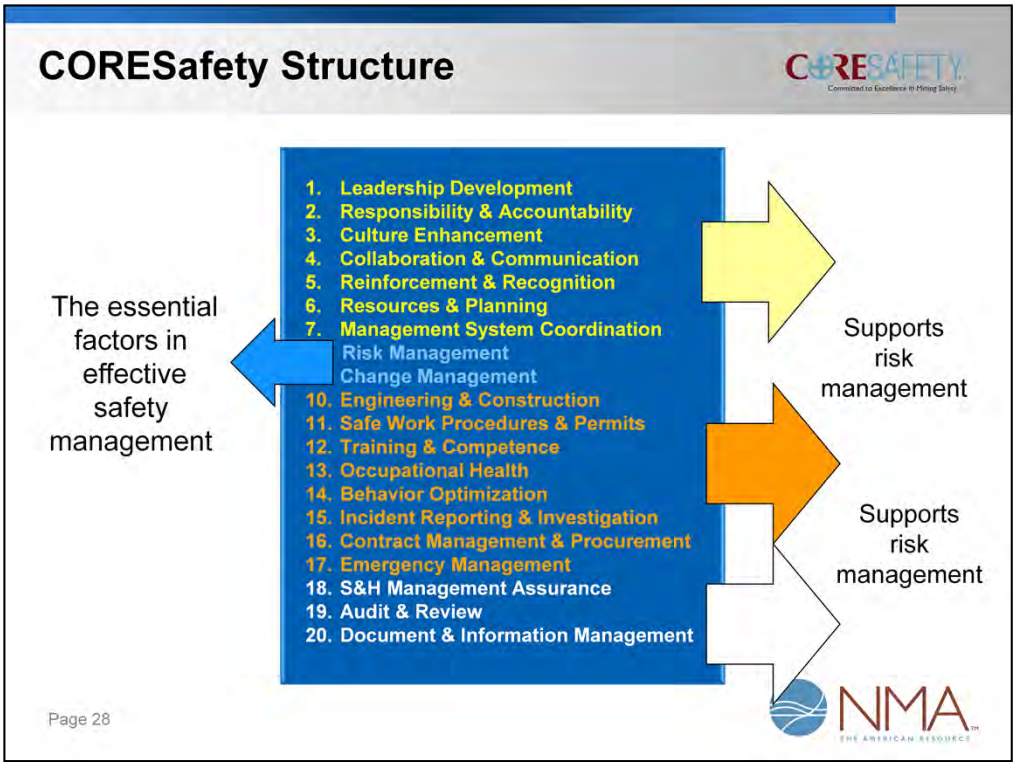



Risk management is not new to NMA. In 2006 NMA sponsored a commission to study how risk management could be integrated into the industry despite the absence of any requirement from MSHA. The commission comprised many top experts from industry, labor, academia and government.

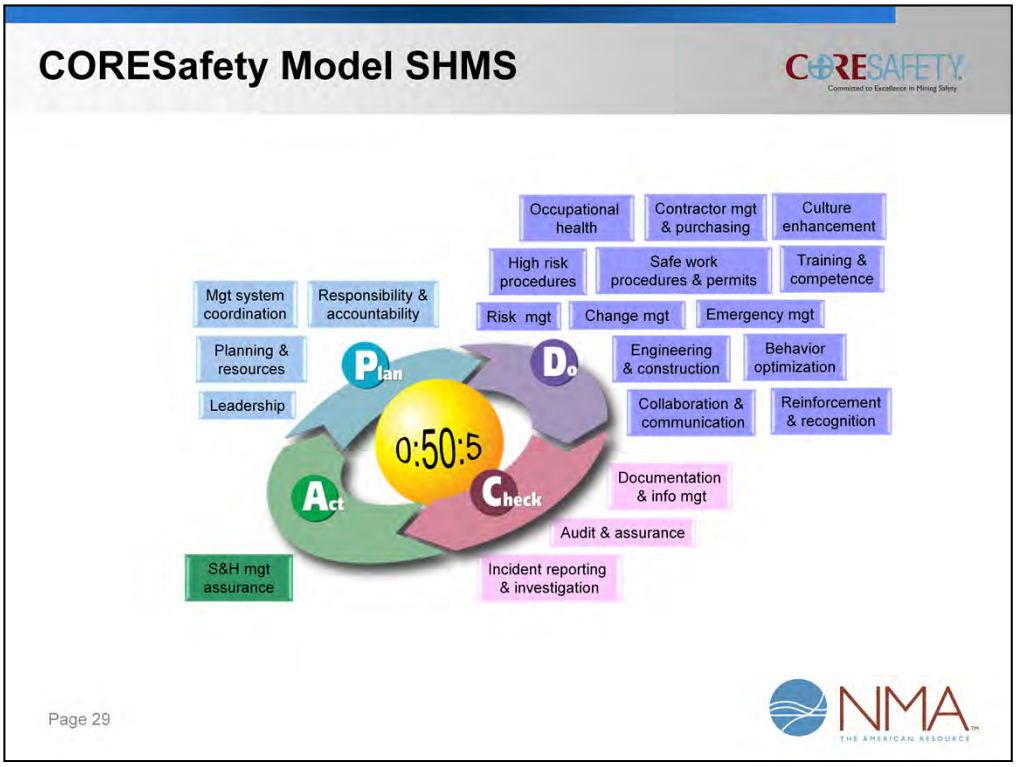

The Commission made a number of recommendations, many of which took root in **CORE**Safety. Most importantly, that mines should conduct risk assessment and ensure there is a management plan to control those risk that are determined to be unacceptable.




For those unfamiliar with **CORE**Safety, it is a risk-centered safety and health management system specific to the U.S. mining industry. It is based on three organizational competencies: leadership, [leadership competencies and leadership development that is complimentary to good safety including the promotion of a strong, positive culture]; 2) safety and health management (the nuts and bolts of safety that we all recognize to one extent or another); and 3)  assurance, or the mechanisms a company uses to verify that their risks are controlled.

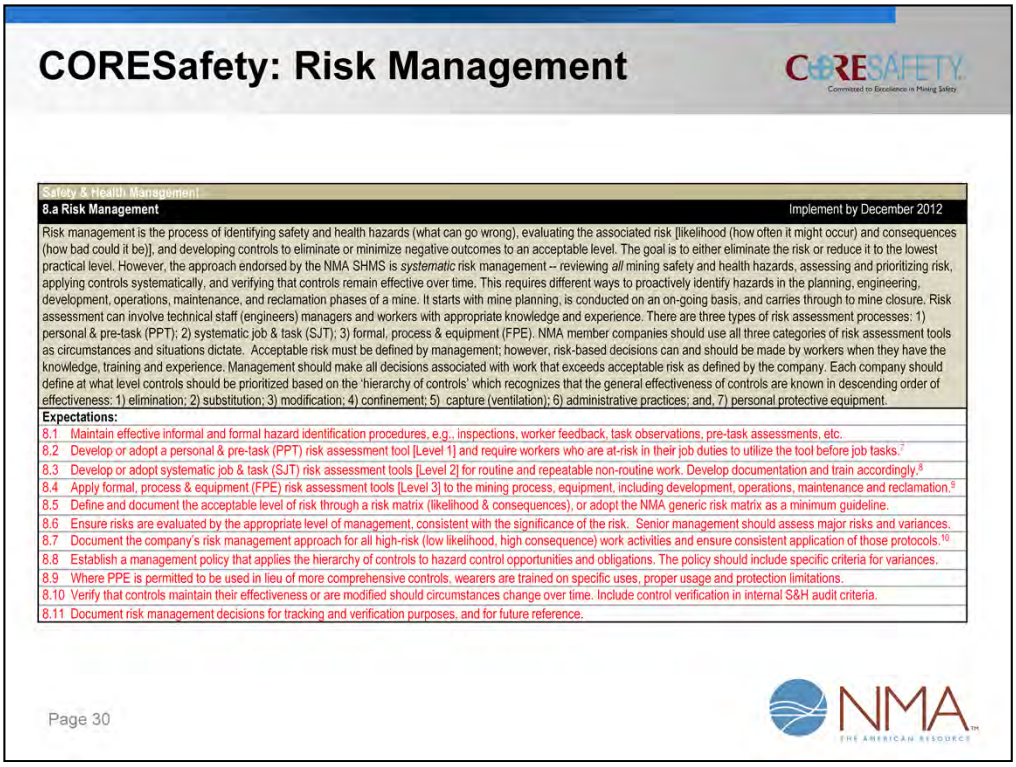



These three mining company core competencies are expressed as 20 system elements or modules, two critical components of which are ‘risk management’ and ‘change management.’ These are for all intent and purpose the heart of the management system and  the heart of effective safety management. Everything else is there to support or reinforce effective risk management.




If we combine the management system modules and this idea of continuous, systematic improvement, we get something like this. Each module plays a part in making the system work, but the overall purpose of the system is risk management.

Each module is important as a part of the Plan-Do-Check Act (PDCA) system, but each module must be managed according to PDCA for the system to work optimally.



## CORESafety: Risk Management

Safety & Health Management:

**8.a Risk Management** — Implement by December 2012

Risk management is the process of identifying safety and health hazards (what can go wrong), evaluating the associated risk [likelihood (how often it might occur) and consequences (how bad could it be)], and developing controls to eliminate or minimize negative outcomes to an acceptable level. The goal is to either eliminate the risk or reduce it to the lowest practical level. However, the approach endorsed by the NMA SHMS is *systematic* risk management -- reviewing *all* mining safety and health hazards, assessing and prioritizing risk, applying controls systematically, and verifying that controls remain effective over time. This requires different ways to proactively identify hazards in the planning, engineering, development, operations, maintenance, and reclamation phases of a mine. It starts with mine planning, is conducted on an on-going basis, and carries through to mine closure. Risk assessment can involve technical staff (engineers) managers and workers with appropriate knowledge and experience. There are three types of risk assessment processes: 1) personal & pre-task (PPT); 2) systematic job & task (SJT); 3) formal, process & equipment (FPE). NMA member companies should use all three categories of risk assessment tools as circumstances and situations dictate. Acceptable risk must be defined by management; however, risk-based decisions can and should be made by workers when they have the knowledge, training and experience. Management should make all decisions associated with work that exceeds acceptable risk as defined by the company. Each company should define at what level controls should be prioritized based on the 'hierarchy of controls' which recognizes that the general effectiveness of controls are known in descending order of effectiveness: 1) elimination; 2) substitution; 3) modification; 4) confinement; 5) capture (ventilation); 6) administrative practices; and, 7) personal protective equipment.

**Expectations:**

| | |
|---|---|
| 8.1 | Maintain effective informal and formal hazard identification procedures, e.g., inspections, worker feedback, task observations, pre-task assessments, etc. |
| 8.2 | Develop or adopt a personal & pre-task (PPT) risk assessment tool [Level 1] and require workers who are at-risk in their job duties to utilize the tool before job tasks.[7] |
| 8.3 | Develop or adopt systematic job & task (SJT) risk assessment tools [Level 2] for routine and repeatable non-routine work. Develop documentation and train accordingly.[8] |
| 8.4 | Apply formal, process & equipment (FPE) risk assessment tools [Level 3] to the mining process, equipment, including development, operations, maintenance and reclamation.[9] |
| 8.5 | Define and document the acceptable level of risk through a risk matrix (likelihood & consequences), or adopt the NMA generic risk matrix as a minimum guideline. |
| 8.6 | Ensure risks are evaluated by the appropriate level of management, consistent with the significance of the risk. Senior management should assess major risks and variances. |
| 8.7 | Document the company's risk management approach for all high-risk (low likelihood, high consequence) work activities and ensure consistent application of those protocols.[10] |
| 8.8 | Establish a management policy that applies the hierarchy of controls to hazard control opportunities and obligations. The policy should include specific criteria for variances. |
| 8.9 | Where PPE is permitted to be used in lieu of more comprehensive controls, wearers are trained on specific uses, proper usage and protection limitations. |
| 8.10 | Verify that controls maintain their effectiveness or are modified should circumstances change over time. Include control verification in internal S&H audit criteria. |
| 8.11 | Document risk management decisions for tracking and verification purposes, and for future reference. |

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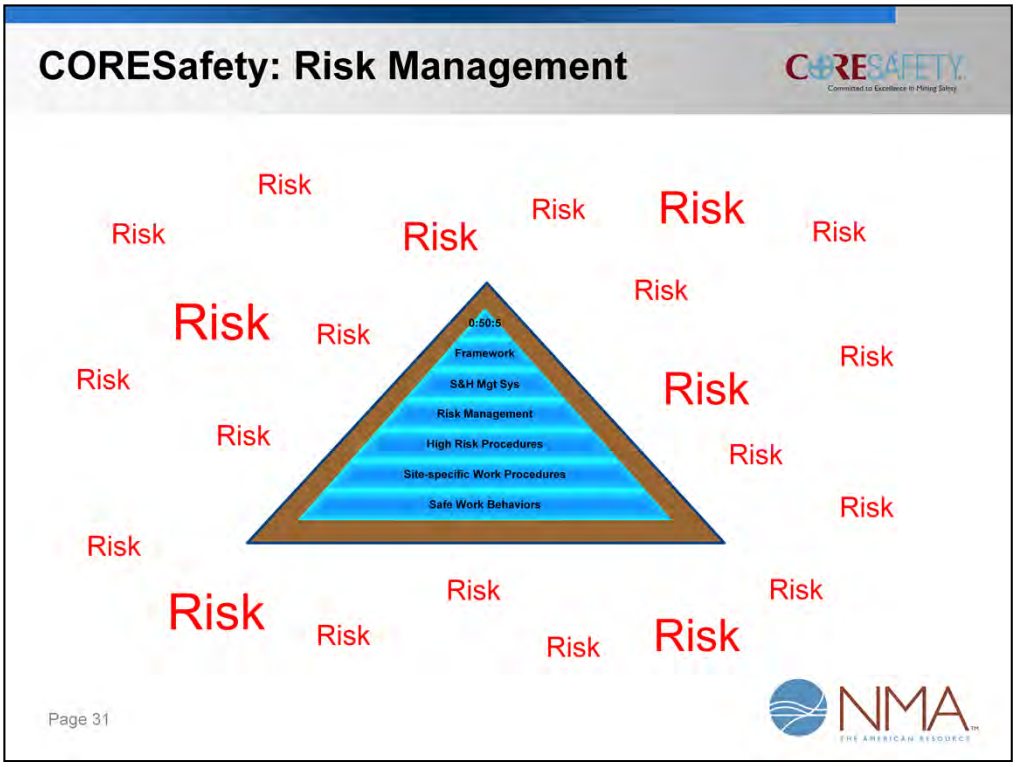
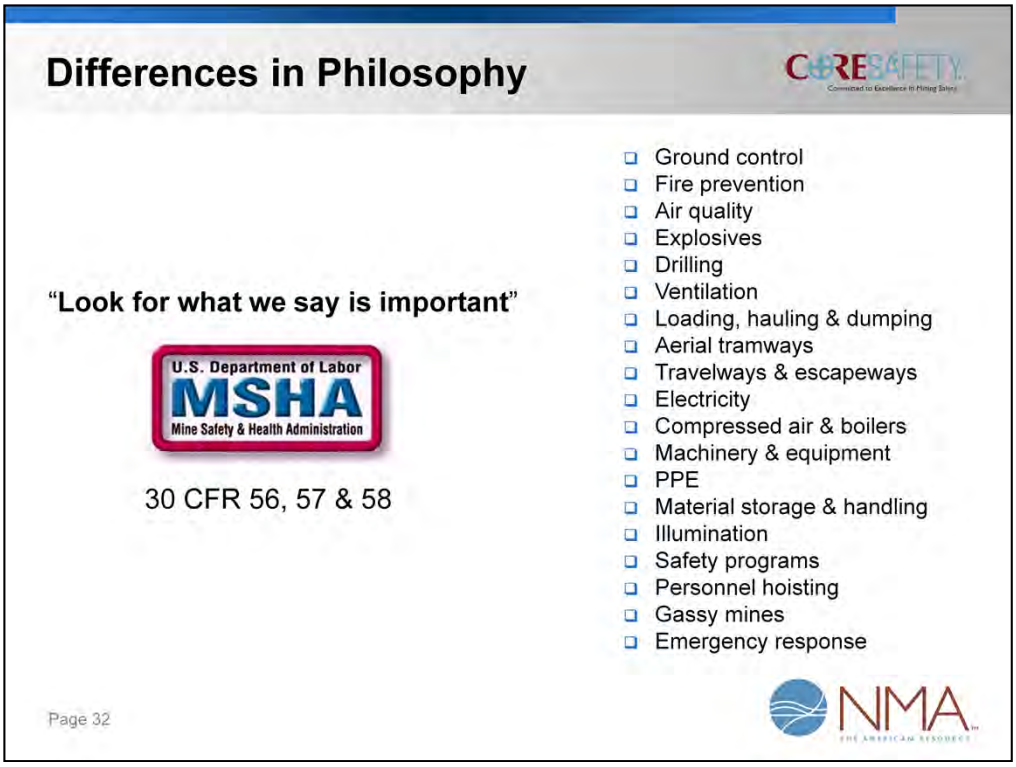
At this point, you may be interested in knowing more about how risk management works within **CORE**Safety and in turn in your company.

All of the material in **CORE**Safety, including this document which provides a discretionary set of expectations for a structured risk management system,can find at **coresafety.org**

The website includes a discussion about the different types of mining risk that need to be assessed and controlled and how other modules need to be integrated with risk management. Again, this isn't the only way to do this, just one example for those companies looking for some direction if you are new to the game.




Risk management isn't something that you perform or conduct only at the senior management level of the company. It needs to have senior management support but must live at the front line to be meaningful. This graphics highlights the connection between the overall performance goal down through the management system to site-specific work practices and employee behaviors.




So how does all this compare with MSHA?

Whereas MSHA is concerned with a pre-determined set of hazards, e.g., ground control, explosions, fire, machine, guarding hoisting, load, electricity, etc., risk management is concerned with identifying all potential hazards and understanding their risk.

30 CFR has many hazard-specific  programs and recommended controls, but it does not require systematic control or management of all risks.

## Differences in Philosophy

"Look for what we say is important"

U.S. Department of Labor MSHA Mine Safety & Health Administration

30 CFR 56, 57 & 58

"Systematically look at all risks"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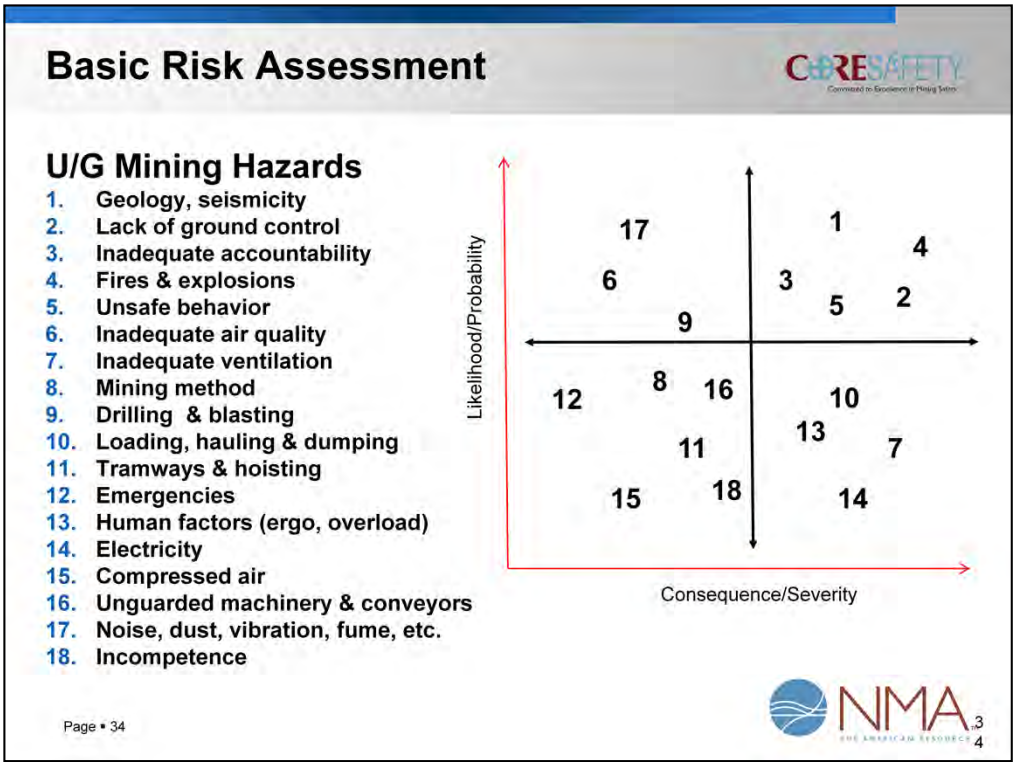
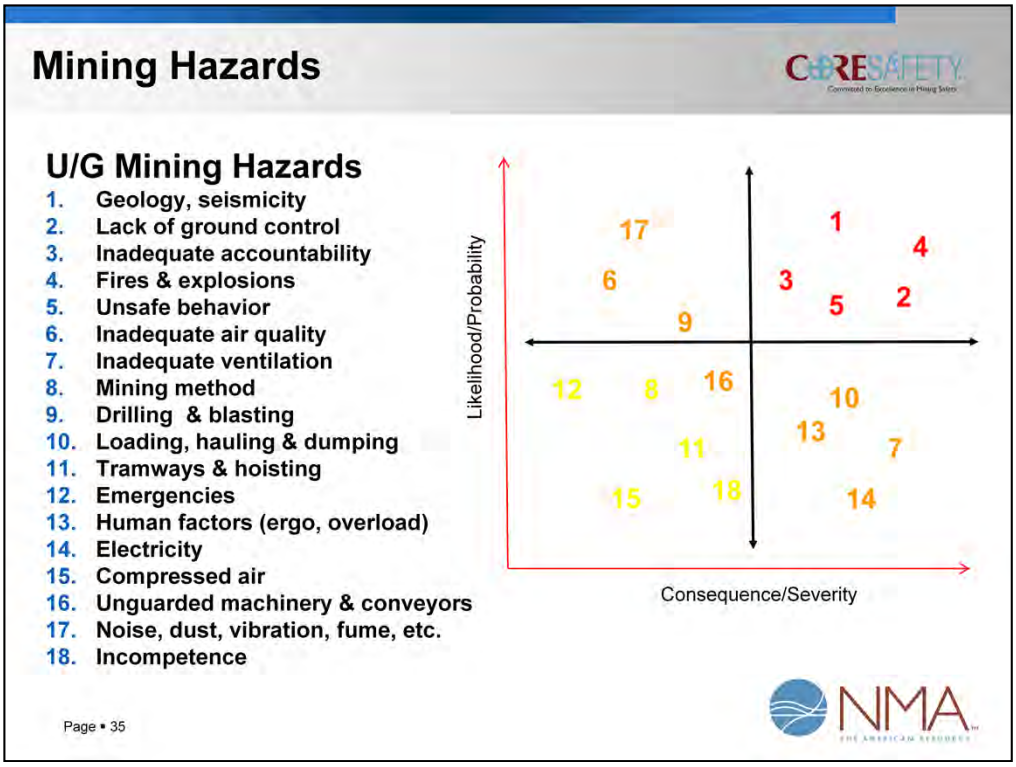
Does your company look at prescribed lists of hazards or take a more comprehensive approach?



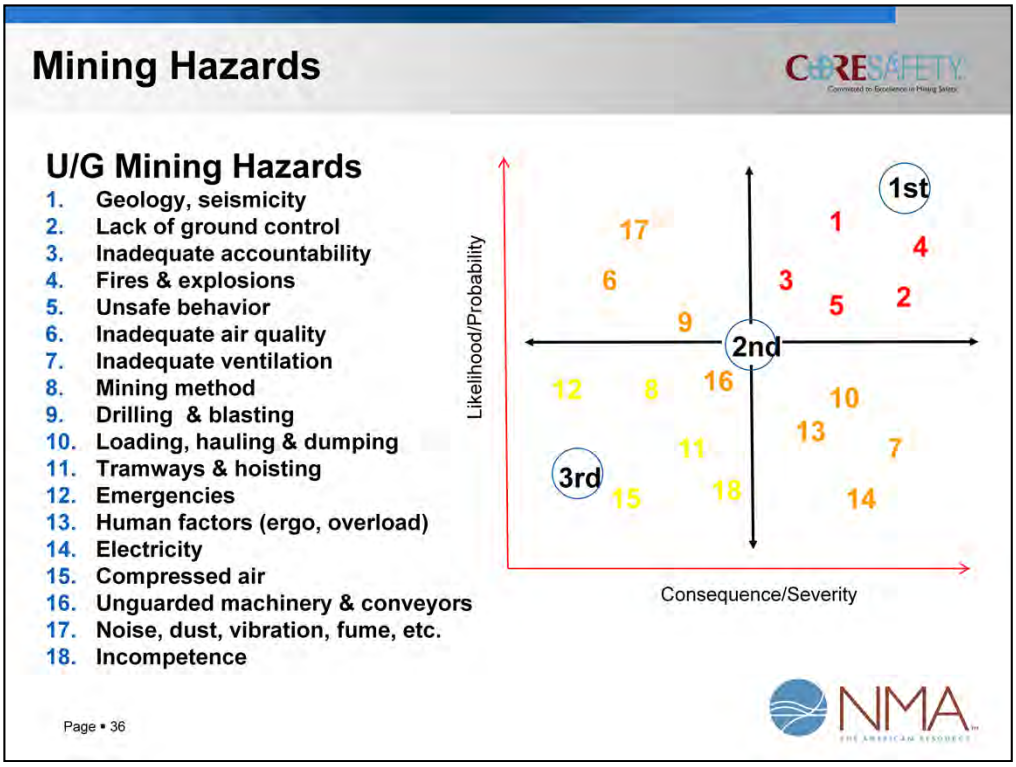

Let's take a look at a very basic example of how risk management can work. Assume we are looking at the hazards and risks associated with a mine that your company is considering acquiring. As part of the due diligence, you and some of your company's subject matter experts get together to discuss hazards that exist at the mine and their relative risks.

Working from very general to more specific hazards, we plot each hazard according to its likelihood to be a problem, and if they are, how significant a problem they would be. This risk matrix is the simplest form of risk assessment with each axis going from low at the bottom left to high at the end of each axis.

The numbers and their relative position on the chart are for demonstration purposes and don't represent true risk assessment.

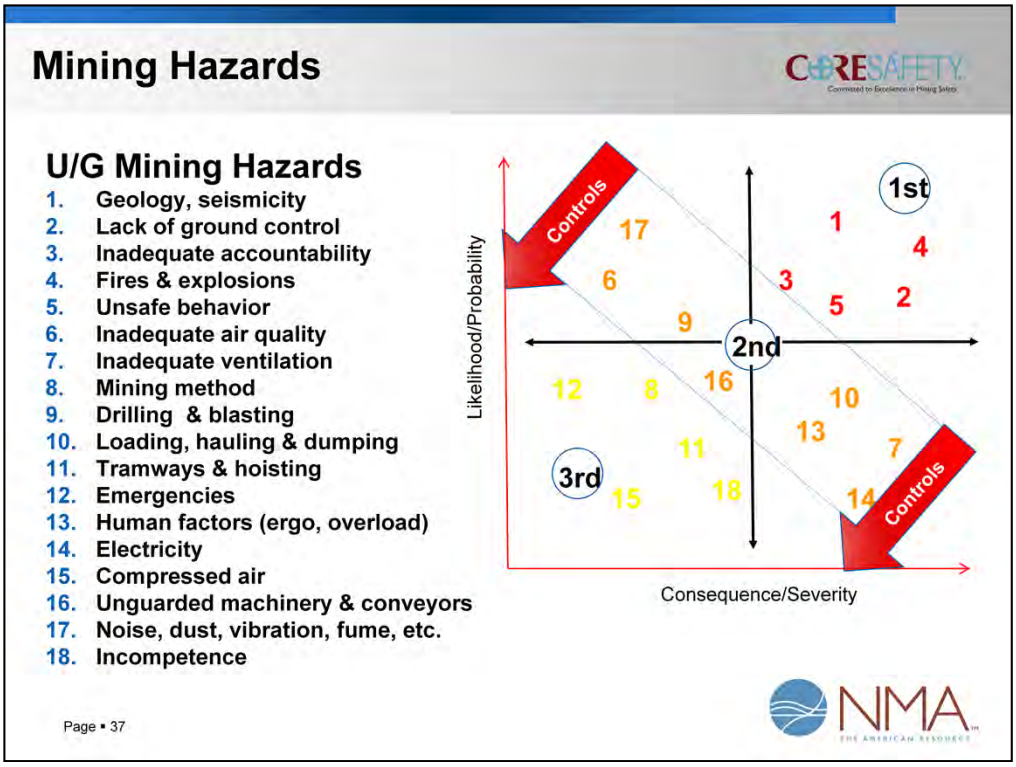



We now have a qualitative ranking of each risk based on our judgment of probability and consequence. The hazards in the top right quadrant represent the highest risks. The risks in the lower left quadrant represent the lowest risks. The other risk are in between. So the question you should be asking yourself at this point is: what do I do with these rankings?

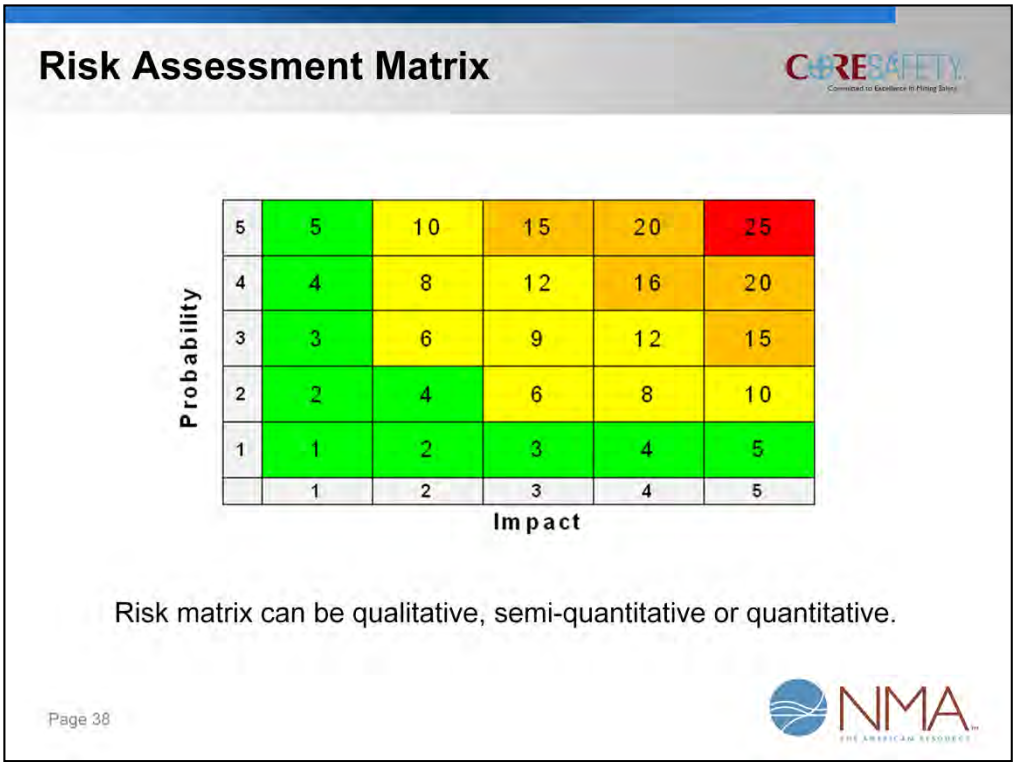



The answer is a number of things, but start with an understanding of the best strategy for applying hazard controls. You should ensure that with your available resources the risks in the segment 1 are controlled followed by segment two and finally segment three which contains the lowest risks.

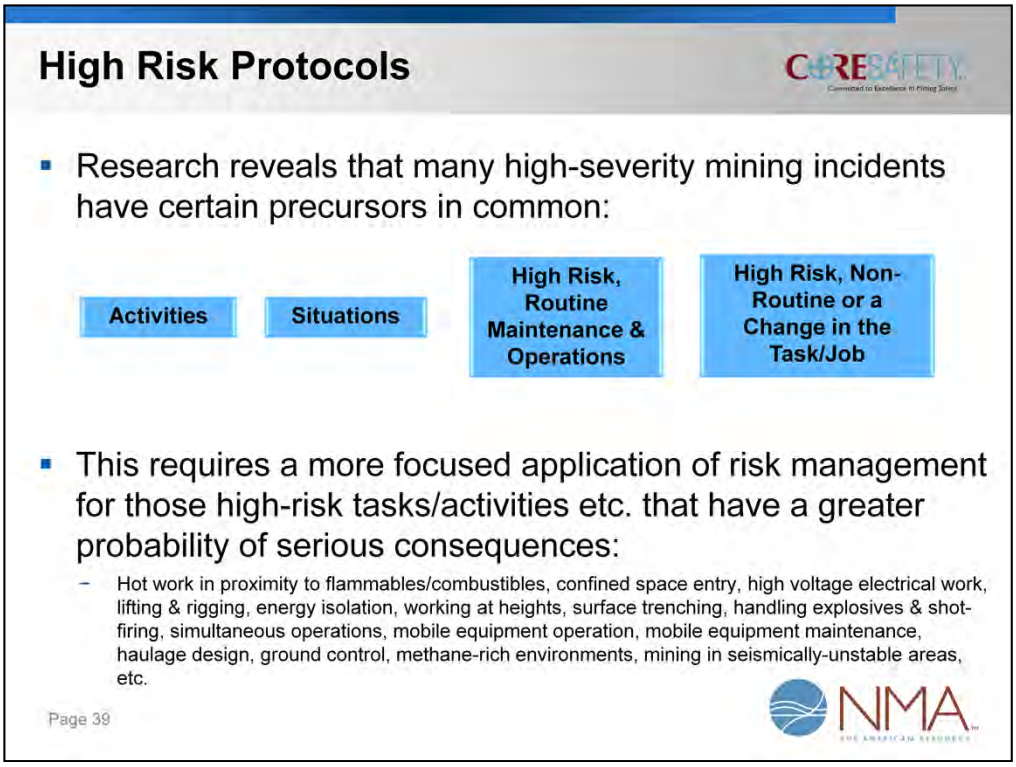
This is not to suggest that you only address risks in segment two once you have fully controlled segment 1. Rather that they should be addressed simultaneously, but with a bias to full control beginning in quadrant 1.




We can say that the risks in segments 1, 2 and 3 are similarly weighted. Some mining personnel with experience in risk assessment say they are different, but related, iso-bands of risk.

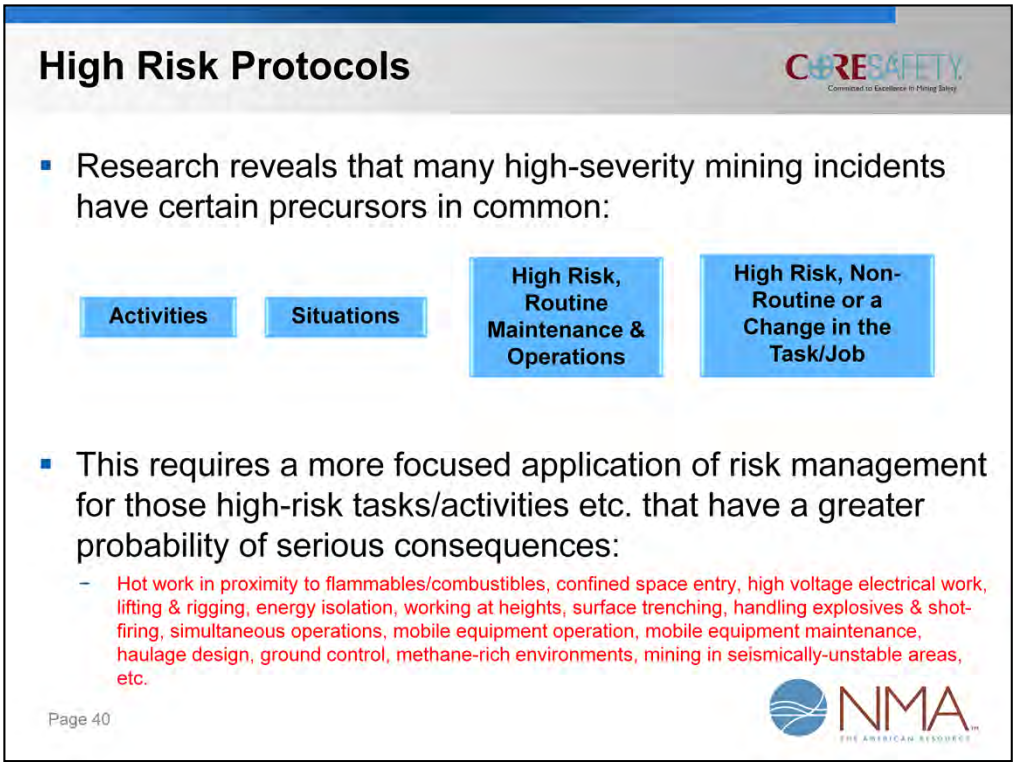



This activity is called risk assessment. To enable you to do this work in a consistent and objective manner, many companies used one or more risk matrices. They apply a numbering or ranking system to each risk. This is a 5 X 5 risk matrix. They can be up to 20 X 20 depending on how well you can differentiate the levels of risk. The lower the number, the lower the risk.

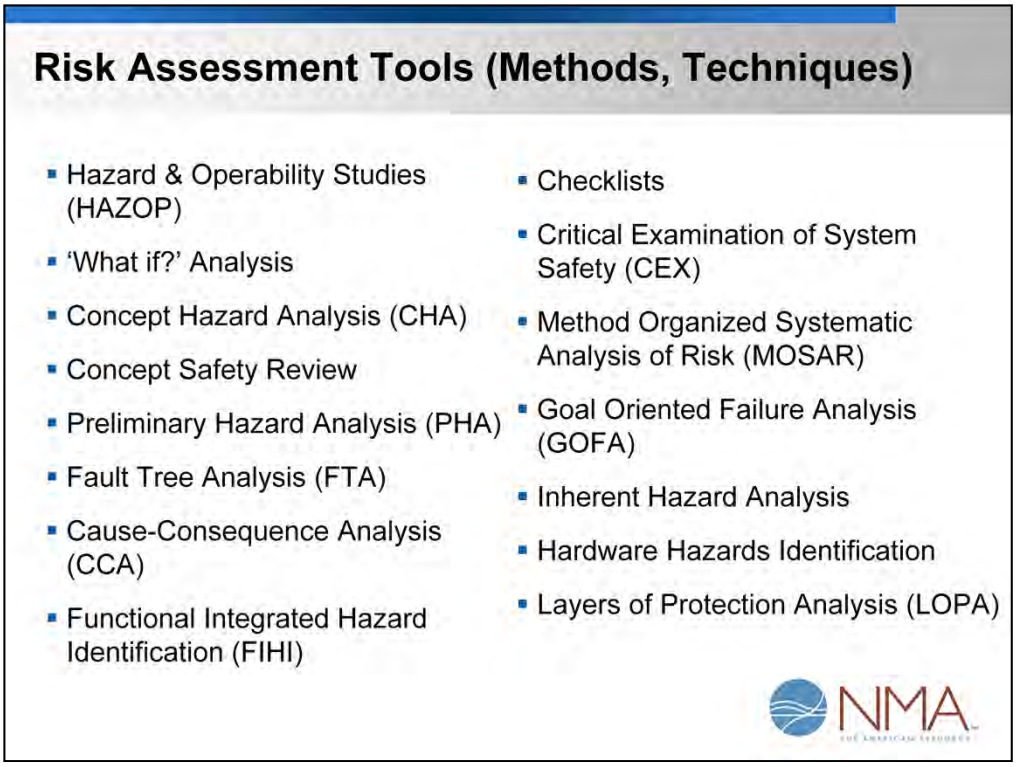



As alluded to already, not all risk is the same in terms requiring our attention, focus and assurance that we have them fully controlled. Specifically, we know there are certain patterns of work that represent higher potentials of risk.

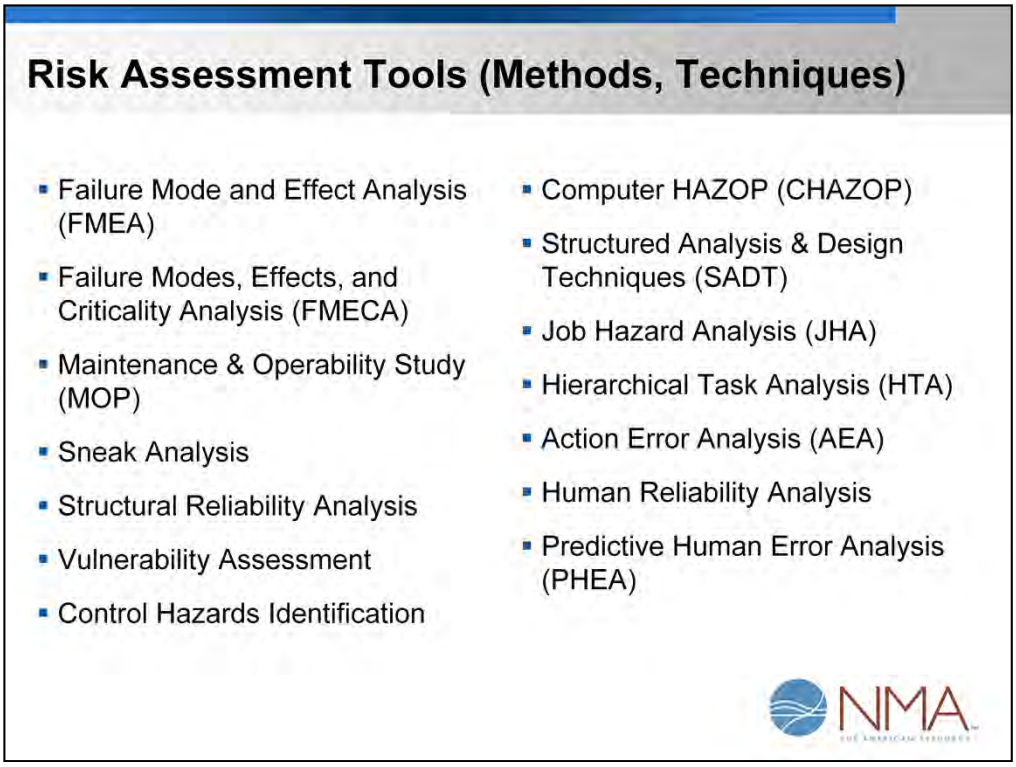
Certain activities, situations, and tasks or operations are precursors to high potential incidents. Effective risk assessment should focus on these elements some, but not all of which, might be similar between mining companies.




Here in red you see some of the types of work tasks that have been designated as high potential risk within many companies developing focused systems of control for these activities -- including a variety of broad and deep controls.

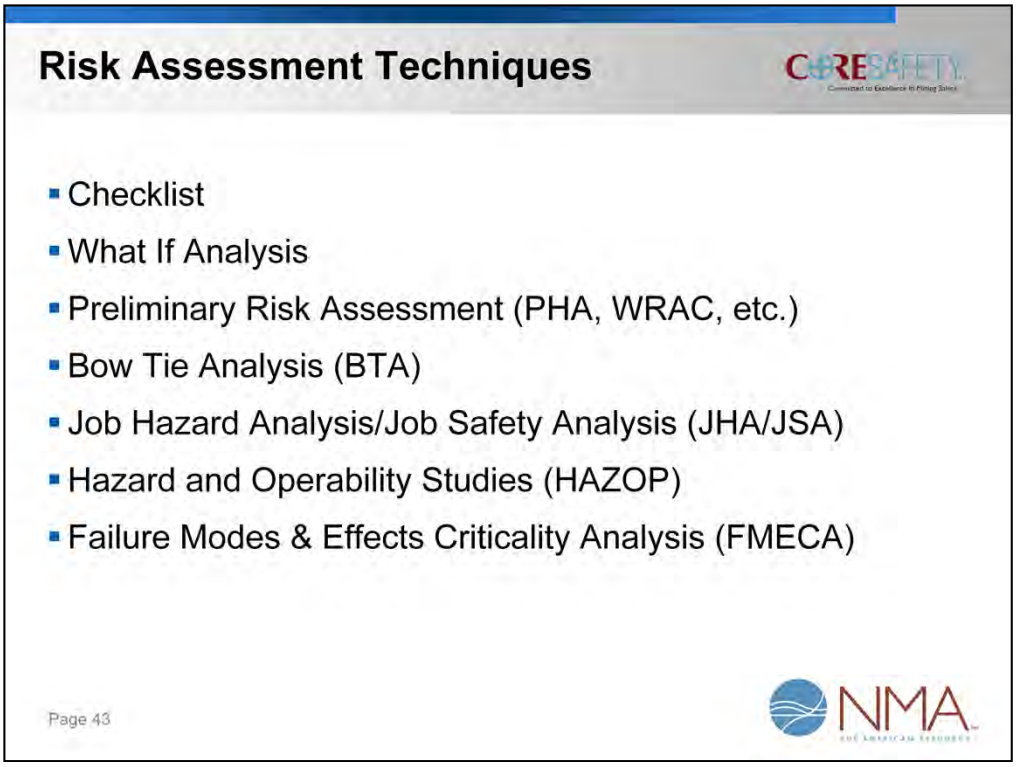



While we've showed you perhaps the most basic form of risk assessment in this webinar, there are more then 40 different specific risk assessment tools or techniques to aid you and your company in assessing mining risks. Some are very general and can be applied to any risk (but are not very precise), others are more objective, complex and structured, while still others are highly specialized.

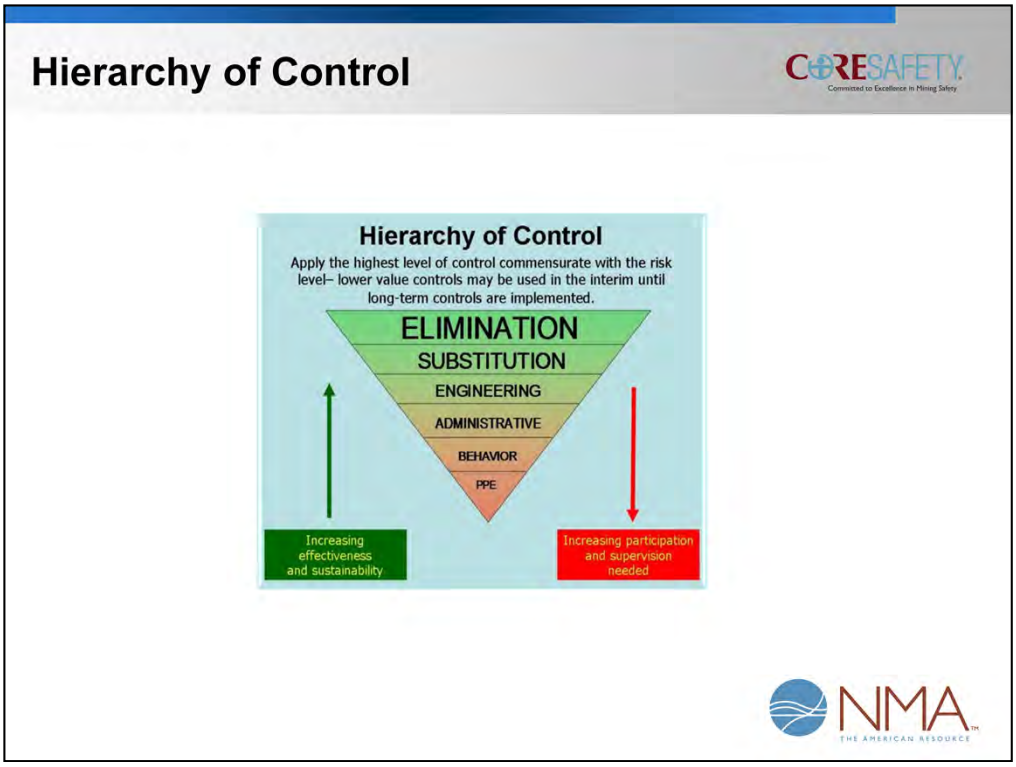



Some of these were developed by government entities, the military, by academics, by consultants and by companies. So how do you know which ones will work best for your company?

The best answer is for you to learn about as many of these as you can and decide based on a comparison which best serves your particular needs. Trial and error and other industry experience has revealed that there are about six of seven which seem to address the types of risks we most often encounter in the mining industry.

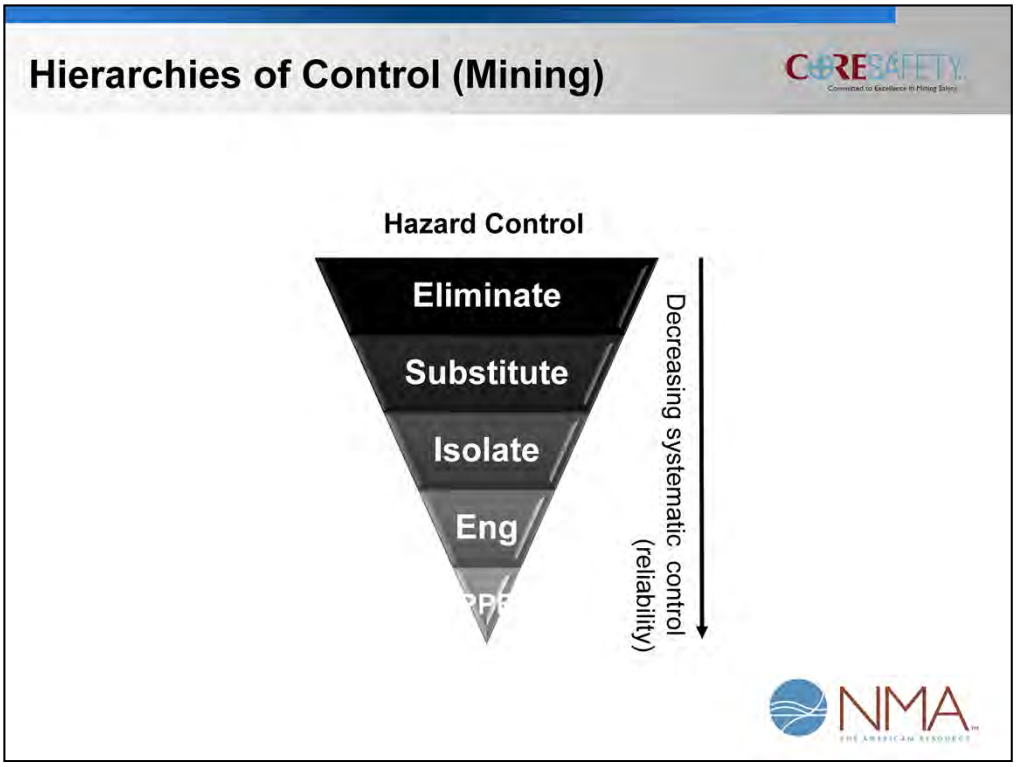



Checklists, what if analysis, what if analysis sometimes combined with checklists, preliminary risk assessment, bow tie analysis (perhaps the most commonly applied risk assessment tool in the world), job hazard or job safety analysis, HAZOP and failure modes, effects and criticality are all useful techniques for the mining industry. Their applications may be different and this is not to suggest there are no others that would be useful to apply, but if you are beginning your risk assessment journey, know that you can reduce the big list to something a bit more manageable and make your decisions from there.



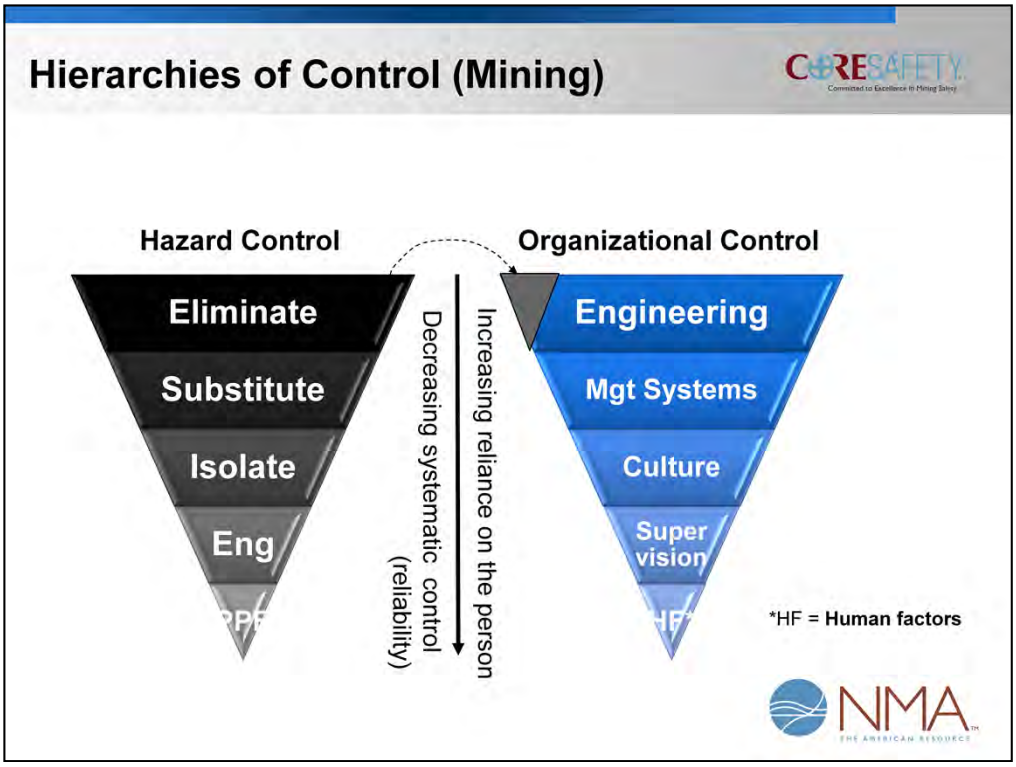

Once you have assessed your risks, you need to determined appropriate controls. This topic is a year long webinar by itself, but we can offer a very concise framework to help you decide what type of control to apply first. The hierarchy of control is well-known in our industry, but perhaps not as institutionalized in many companies as it should be.

The hierarchy suggests that the most effective controls are at the top of the inverted pyramid and those at the bottom, (i.e., PPE) are the least effective.

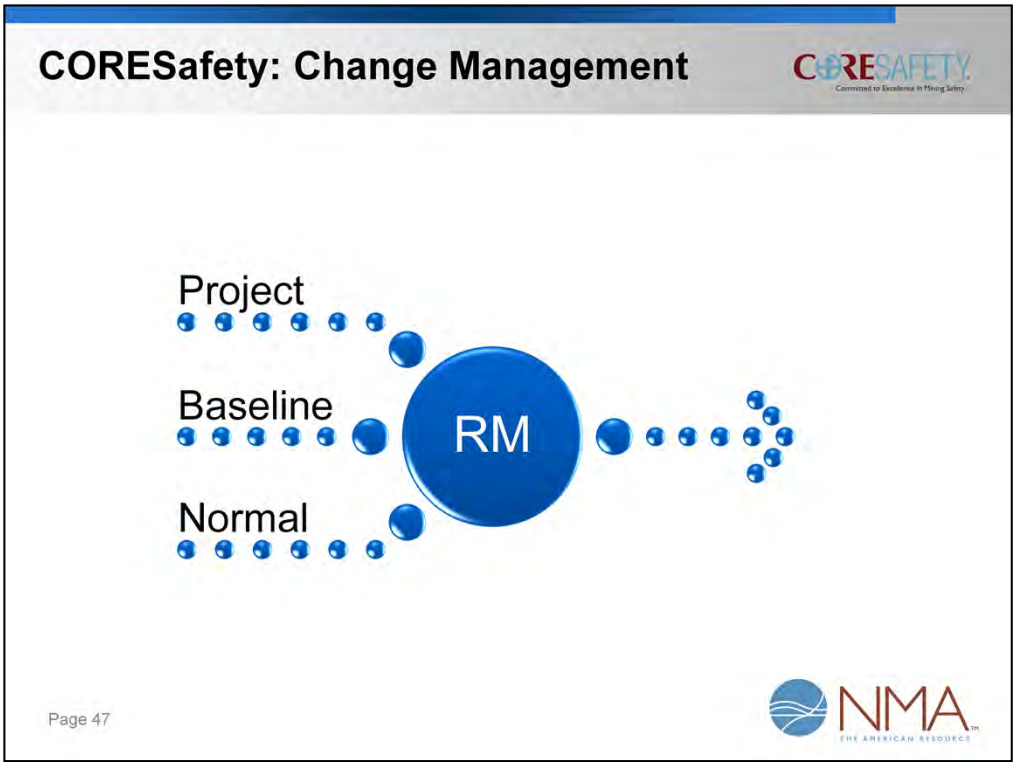



Here is another way of looking at the same issue. The hierarchy represents a decreasing degree of systematic control as you go lower in the hierarchy. In other words, the reliability of the control decreases primarily because you rely more on human factors.

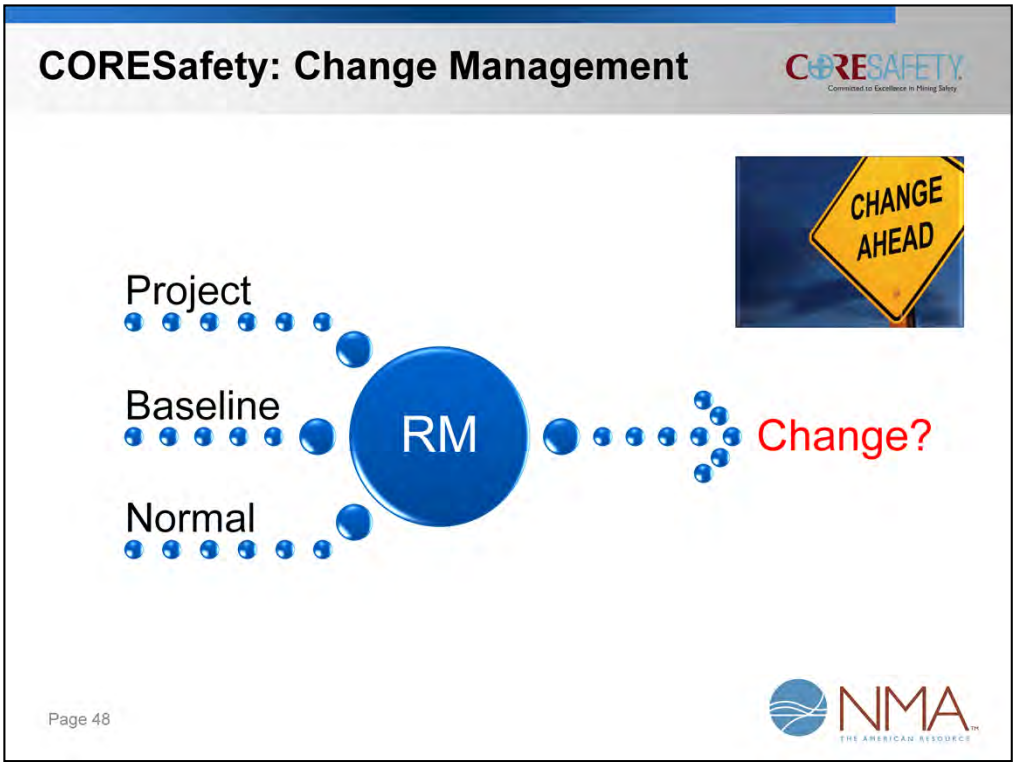
Regardless of resources, good risk management practice begins with the application of the most reliable control. If it is ineffective, unrealistic, clearly not cost-effective, then other options should be considered.



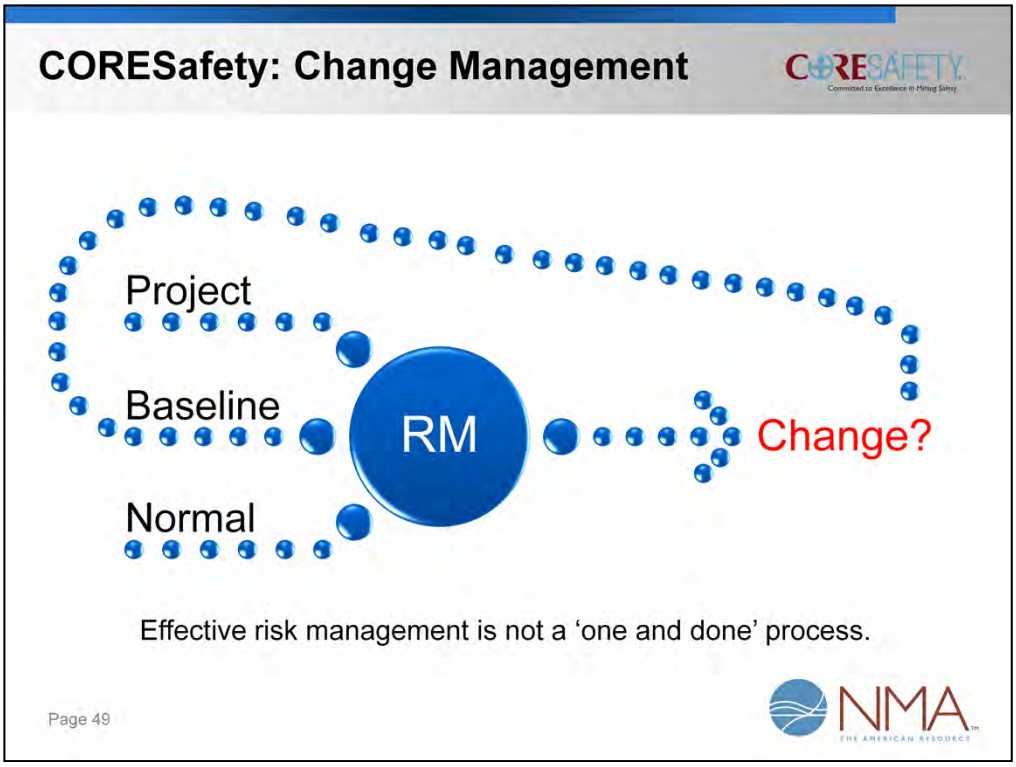

However, there are other forms of control that need to be considered in addition to the physical controls. This second  inverted pyramid represents the organizational controls that are complimentary, but not necessarily mutually exclusive from the standard hierarchy of control. These two pyramids overlap .




Now you're making good progress in getting your arms around this thing called risk management. If you are accustomed to managing safety only according to your obligations under 30 CFR you can quickly see that this a departure from MSHA's prescribed and limited approach. There is greater opportunity and obligation in risk management. One of the obligations is the realization that risk management is not a one time activity.




You may apply risk assessment as a baseline for all hazards in a mine or limit it to a project for normal operations. But what do you do when the assumptions you used to conduct your risk assessment change?




It is then necessary to assess the degree to which the change affects judgments of risk and the associated controls. It may not be necessary to totally discard your earlier risk assessments, but to assess the impact of the change on other risk management decisions. Some companies develop criteria to indicate when a change requires a reassessment.

For example, if your company elects to start using different haul trucks, it is probably necessary to determine how the new trucks will affect safety. However, if you are buying the same model of truck for which there are no new features that change the risk ranking associated with their use, also known as replacement-in-kind, it may be unnecessary to reassess the risks and controls.


That was a very fast, high level review of the basics of risk management.

So how are mining companies approaching this new way of old thinking? Some are taking a very comprehensive view and integrating the risk management process into ***everything*** they do.

Others are applying the RM process only to catastrophic risk where they see the greater need for assurance of control.

Other mining companies are starting by focusing only on operations and maintenance risk with subsequent change management provisions.

Still other are starting on a smaller scale and looking for other areas where it can add value as they become more competent in its application.

In other words, there is no one right way to do this. The best way is the one that gives your mine or company the best control of the risks that threaten miners and other assets.

## Approaches to Mining Risk Management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You must also consider how broadly you will apply these tools: narrowly focusing only on production or to expand them to the full cycle of mining in your mine or company.

## The Balancing Act


**Is this effective?**

**Is this sustainable?**

**Can they be integrated?**

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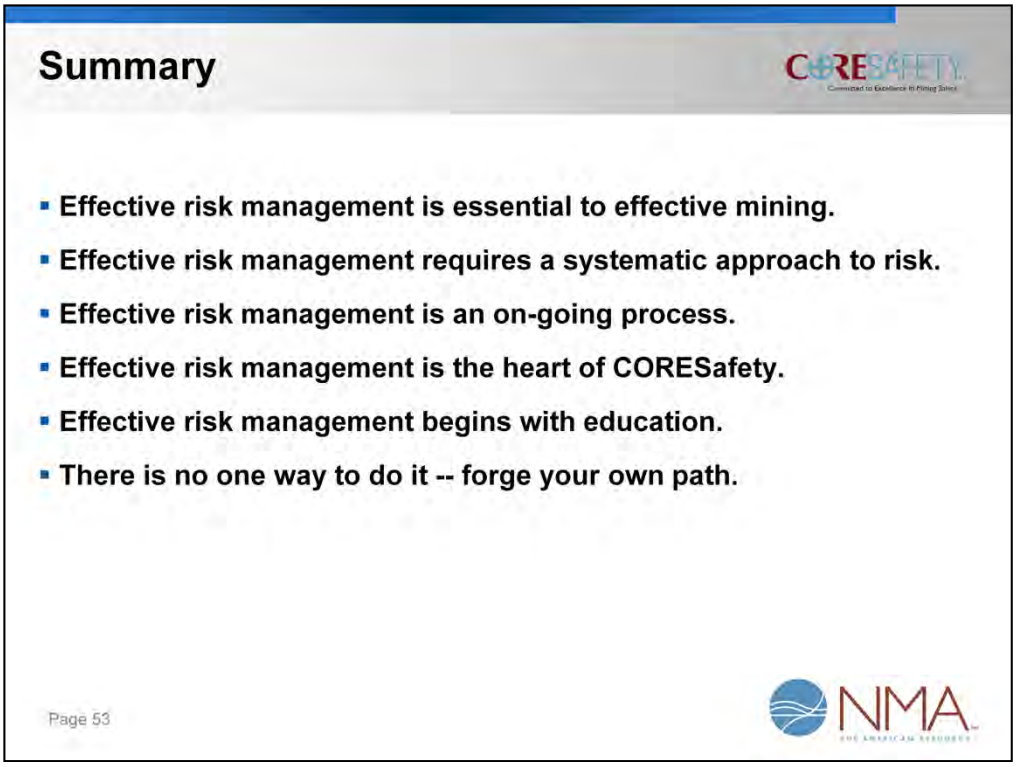
For some, integrating risk management into your toolbox along with all your MSHA obligations can seem like riding two horses at once. Trust the process and look what happens to your views about compliance when the controls you select for your risks are different than or additive to the requirements in 30 CFR. Having made the adjustment you and your colleagues will be all the better for it and you'll be ahead of the game if MSHA promulgates a risk management regulation.




To summarize, good risk management is good mining which means fewer losses across the board: operations, maintenance, safety etc.

However, good risk management can't be applied to a few discretionary hazards and expect it to be effective.

Likewise, it must be an ongoing process so the sooner you develop the internal competence to  do it well, the better off you will be.

As envisioned by **CORE**Safety, risk management is a very good place to start as the essence of safety is identifying hazards, assessing their risk, applying controls and ensuring they remain effective.

Some aspects of risk management are intuitive, but the devil is in the details so seek out knowledge where it is available.

Lastly, don't be distracted by what some other mining companies are doing unless you are in the benchmarking mode.  Seek the best path for your company by using risk assessment as intended: apply it to the issues of greatest concern in your company and work outward from there.

Thank you for your attention.

## Thank You For Your Attention

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**www.coresafety.org**