The Value of Enterprise Risk Management in Strategic Planning
WHAT IS RISK?

Oxford Definition in 1655
- the possibility of loss, injury, or other adverse or unwelcomed circumstances

ISO 31000
- defines risk as the effect of uncertainty on objectives. Uncertainties caused by ambiguity or lack of information. It includes both negative and positive impact of objectives.

OSHA
- defines risk as the product of the probability of a hazard resulting in an adverse event, times the severity of the event

Information Security
- Is defined as the potential that a given threat will exploit vulnerabilities of an assets and thereby cause harm to the organization

Financial
- Is often defined as the unexpected variability or volatility of returns

Risk can be seen as relating to the PROBABILITY of uncertain future events
GROUP ACTIVITY?

The many inconsistent and ambiguous meanings attached to “risk” lead to widespread confusion and also mean that very different approaches to risk management are taken in different fields.

• Come up with a universal definition of risk that you can explain to the CEO of your organization during a 60 second ride up with him on the company’s elevator.
Like organizations within the private sector, the UC system operates in an inherently risky environment. By strategically managing risk, they can reduce the chance of loss, create greater financial stability, and protect their resources so they can continue their mission of supporting teaching, research and public service.

- **Everyone a Risk Manager**
- **Be Smart About Safety**
- **Enterprise Risk Management Information System**
- **Annual ERM Summits**
**RISK ATTITUDE**

**Three types**

**Risk Seeker**
Has the greatest potential for reward, but may underemphasize a risk impact, variance and potential negative effects

**Risk Avoider**
Is obsessed with risk and typically will try and transfer all risk to another entity

**Risk Optimizer**
Finds the ideal risk-reward relationship where they realistically evaluate potential outcomes and consequences
STRATEGIC DIRECTION OF THE ORGANIZATION

- **Strategic goals**: Are created on the board or executive level and are general and conceptual and give the organization its direction.

- **Operational objectives**: Are created at the staff management level and are functional in nature and cut across all departments within an organization.

- **Tactical Objectives**: Are created at the line management level and represent specific tasks. These objectives relate to producing the organization’s products and services.
Washington State Department of Transportation has a strategic plan 2011-2017 that lists six strategic goals:

- **Safety** - to provide for and improve the safety and security of transportation customers and the transportation system
- **Preservation** - to maintain, preserve and extend the life and utility of prior investments in transportation systems and services
- **Mobility** - to improve the predictable movement of goods and people throughout Washington state
- **Environment** - to enhance Washington’s quality of life through transportation investments that promote energy conservation, enhance healthy communities and protect the environment
- **Stewardship** - to continuously improve the quality effectiveness and efficiency of the transportation system
- **Economic Vitality** - to promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy
# ERM Objectives of Strategic Goal Safety

<table>
<thead>
<tr>
<th>Highway Safety</th>
<th>Ferries Safety</th>
<th>Airport Safety</th>
<th>Rail Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduce fatal and serious injury collisions by 50% over the next ten years, moving towards Target Zero-Work with partners, including Federal Highway Administration, Washington State Traffic Safety Commission, Washington State Patrol, and local agencies to identify and address priority highway safety needs.</td>
<td>• Improve safety on state ferry vessels and terminals. Improve vessel-life saving capabilities, improve the post-accident investigation process, and expand ferries’ Safety Management System.</td>
<td>• Improve safety at 16 state-managed airports. Remove physical obstacles such as trees that intrude into critical airspace.</td>
<td>• Improve the safety and security of rail transit systems, including light rail, street cars, and monorail. Administer federal rail transit safety oversight requirements for rail transit systems.</td>
</tr>
</tbody>
</table>
ERM OBJECTIVES TO STRATEGIC GOAL OF SAFETY

**System and Facility Security**

Improve WSDOT’s ability to prevent, mitigate, and respond to acts of terrorism on transportation systems and facilities. Implement high-priority infrastructure “burdening” capital projects identified in vulnerability assessments. Improve ferry vessel security.

**Continuity of Operations, Emergency Management, and Responses**

Increase WSDOT’s ability to respond to, recover from, and deliver vital services during emergencies and disasters—improve planning and coordination with local and regional partners, improve WSDOT’s emergency response capabilities.

**Workers Safety**

Continue to advocate WSDOT’s worker safety program to attain injury and illness reduction targets with the goal of zero work-related injuries and illnesses by 2019. Enhance communication of workers safety expectations and goals within WSDOT and with partners and establish a comprehensive return-to-work program.

**Bridge Risk Reduction**

Reduce the risk of bridge collapse due to earthquakes, liquefaction, and foundation scour during high water flows. Complete bridge seismic retrofit projects funded by the Transportation Partnership Account to reduce seismic risks. Develop and begin implementing the I-5 lifeline corridor plan to provide for safety and mobility during catastrophic events.
Dakota County, Minnesota
Has created an Operations Management-Risk Management and Homeland Security Manual that is tied to their annual budget and identifies key accomplishments (strengths) by strategic goals and challenges (weaknesses) by strategic goals. Key accomplishments are broken down into three perspectives:

- Stakeholder
- Financial
- Internal
CASE STUDY-DAKOTA COUNTY, MN

• **Stakeholder perspective**- is to provide a safe, healthy and productive environment

• **Financial perspective**- is to deliver cost effective solutions

• **Internal perspective**- is to capitalize on innovation
CASE STUDY - DAKOTA COUNTY, MN

Annually, Dakota County, MN reviews their accomplishments and their challenges towards their strategic goals:

Accomplishments-
• Recognized by Minnesota Safety Council with the Award of Honor for the County’s safety performance
• Developed the County’s After Action Report
• Updated the Continuity of Operations Plan
• Completed awareness training on how to prevent slips, trips and falls
• Secured $ 292,750 for new radio channel
CASE STUDY- DAKOTA COUNTY, MN

It is important to not only list responses to challenges, but also come up with a method to track who within the organization will be accountable for the response to the identified challenge:

- Provide on-going management and technical support for new radio channel
- Develop investment justification for projects under the 2010 Homeland Security UASI grant program
- Assist County Emergency Manager in updating the All Mitigation Plan
OVERVIEW OF ERM FRAMEWORKS

**COSO II**
- Focus is to establish ERM goals as part of the strategic management process. It does not dive into the details of risk management approaches and process, but addresses threats to the organization and the need for proper controls.

**ISO 31000**
- Rooted in risk management principles and designed to provide an organized methodology to evaluate risk exposures and react to the environment.
COSO II ERM FRAMEWORK

Every entity exists to realize value for its shareholders

Every entity has to deal with uncertainty

COSO II framework is designed to enable management to:

• To deal effectively with potential future events that create uncertainty
• To respond in a manner that reduces the likelihood of downside outcomes and increases the upside outcomes
Enterprise Risk Management

- Is a process
- Effected by an entity’s board of directors, management, and other personnel
- Applied in a strategy setting and across the entire entity
- Designed to identify and manage potential events that may affect the entity
- Provide reasonable assurance regarding the achievement of entity objectives
COSO II ERM FRAMEWORK

Entity objectives can be viewed in the context of four categories.
INTERNAL ENVIRONMENT
COSO II ERM FRAMEWORK

- Risk Management Philosophy
- Authority and Responsibility
- Organizational Structure
- Risk Appetite
- Management Operating Style
- Board of Directors
- Integrity and Ethical Values
- Commitment to Competence
OBJECTIVE SETTING
COSO II ERM FRAMEWORK

Strategic Objectives

Risk Tolerance

Related Objectives

Risk Appetite

Selected Objectives
EVENT IDENTIFICATION
COSO II ERM FRAMEWORK

- Events
- Risks and Opportunities
- Factors Influencing Strategy and Objectives
- Event Categories
- Methodologies and Techniques
- Event Interdependencies
RISK ASSESSMENT
COSO II ERM FRAMEWORK

Inherent and Residual Risk

Methodologies and Techniques

Likelihood and Impact

Correlation
RISK RESPONSE
COSO II ERM FRAMEWORK

Identify Risk Responses
Evaluate Possible Risk Responses
Select Responses
Portfolio View
CONTROL ACTIVITIES
COSO II ERM FRAMEWORK

Integration with Risk Response
Types of Control Activities
General Controls
Application Controls
Entity Specific
INFORMATION & COMMUNICATION
COSO II ERM FRAMEWORK

Information

Communication

Strategic and Integrated Systems
Monitoring

Improves the ongoing effectiveness of the other enterprise risk management components through:

- Ongoing monitoring activities
- Separate evaluations
- A combination of these two
ROLES AND RESPONSIBILITIES

Four Broad Areas of Roles and Responsibilities

Board of Directors
- Responsible for overseeing management’s design and operation of ERM

Executive Management
- Responsible for the design of an entity’s enterprise risk management framework

Risk Officers
- Work with managers in establishing and maintaining effective risk management

Internal Auditors
- Contribute to the ongoing effectiveness of the enterprise risk management
VALUE AND UTILITY OF COSO ERM

**For Organizations**

- A definition of risk management
- A vocabulary, concepts and principles shared by all the parties involved
- Criteria to evaluate the effectiveness
- Guidelines for entities

**For Managers**

- Align strategy with risk appetite
- Enhance risk response decisions
- Reduce the likelihood and/or impact of negative events
- Seize opportunities
- Identify and manage multiple and cross-enterprise risks

**For Internal Auditors**

- Play an important role in monitoring ERM
- Internal Auditor do not have a primary responsibility for its implementation or maintenance
- Assist management and the board or audit committee in the process
ISO 31000

Risk Management Should Create and Protect Value

• Create and protect value by using risk management to help achieve your organization’s objectives and improve its performance
• Make risk management part of every process within your organization at every level
• Make risk management a responsibility of every manager within your organization
ISO 31000

Risk Management Should Be Part of Your Decision Making

Use risk management to make informed choices

Use risk management to prioritize actions

Risk Management Should Be Used to Deal with Uncertainty

Use risk management to address the uncertainty that your organization faces

Use risk management to identify and define the nature and type of c
ISO 31000

Risk Criteria

Consider your organization and how it functions when you define your risk criteria

Consider the views of your organization’s stakeholders when you define your risk criteria

Consider the consequences, likelihood and level of risk when you define your risk criteria

Consider whether combinations of multiple risks should be taken into account when you define your risk criteria

Consider your organization and how it functions when you define your risk criteria

Consider the views of your organization’s stakeholders when you define your risk criteria

Consider the consequences, likelihood and level of risk when you define your risk criteria

Consider whether combinations of multiple risks should be taken into account when you define your risk criteria
ISO 31000

Risk Assessment Process

Identify your organization’s risks

- Choose suitable risk identification tools
- Select the right people to identify
- Generate comprehensive list of risks

Analyze your organization’s risks

- Estimate your organization’s level of risk
- Specify how much confidence you have in your analysis
- Use your risk analysis to understand your organization’s risk
- Communicate the results
ISO 31000

Risk Assessment

- Evaluate your organization’s risks
- Use the results of your risk analysis to evaluate your organization’s risks
- Use the results of your analysis to consider risk treatment options
ISO 31000

Formulate and Implement Your Risk Treatment Plans

- Explore your organization’s risk treatment options
  - Establish a cyclical risk treatment process
  - Consider your organization’s risk treatment
- Select your organization’s risk treatment options
  - Select the most appropriate risk treatment option
  - Plan the implementation of your risk treatment
ISO 31000

Formulate and Implement Your Risk Treatment Plans

Prepare risk treatment implementation plans
- Document your organization’s risk treatment plans
- Discuss risk treatment plans with all participants
- Carry out your risk treatment implementation plans

Monitor and Review Your Risk Management Process
- Plan your risk management monitoring and review processes
- Monitor and review all aspects of your risk management process
- Record your organization’s monitoring and review results
- Report your risk management monitoring review and results
GROUP ACTIVITY

Describe the benefits of having an ERM program?

How would an ERM program help with the decision making process in an organization?

Tell us about a company from the headlines that would have benefitted from implementing an ERM program in their organization?
MODEL OF GOOD JUDGMENT

"Avoiding Judgment Traps and Biases"
By KPMG, Dr. Glover and Dr. Prawitt from BYU
COSO report March 2012

| Judgment is the process of reaching a decision or drawing a conclusion when there are a number of possible alternative solutions | An effective judgment process will be logical, flexible, unbiased, objective and consistent | It will utilize an appropriate amount of relevant information, properly balancing experience, knowledge, intuition, and emotion |
STEPS OF JUDGMENT PROCESS

1. Define problem and identify fundamental objectives
2. Consider alternatives
3. Gather and evaluate information
4. Reach a conclusion
5. Articulate and document rationale
Rush to Solve - Tendency to want to immediately solve a problem by making a quick judgment results in underinvestment in steps 1 Define problem and identify fundamental objective and step 2 to consider the alternative in the judgment process

• Often the solution is to select the first seemingly workable alternative without sufficient consideration of the problem to be solved and the objectives to be achieved
• As a result of the rush-to-solve trap, decision makers sometimes end up solving the wrong problem, or they might settle for a suboptimal outcome
PITFALLS AND BIASES IN JUDGMENT

Judgment Trigger

Every judgment or decision has an initiating force that triggers a decision and that trigger can lead the decision maker to skip the early steps in the judgment process.

Triggers often come in the form of an alternative masquerading as a problem definition, and thus move forward without a complete understanding of the problem or objectives and without a complete consideration of other alternatives.
PITFALLS AND BIASES IN JUDGMENT

- **Judgment Framing** is a mental structure or perspective that people use to determine the relevance or importance of information

  - Different vistas or frames also are possible with judgment problems; often, there are many possible perspectives on the same situation

  - People’s willingness to take on risk depends on how a situation is framed

  - One way to recognize a frame is by identifying the analogies or metaphors being used
PITFALLS AND BIASES IN JUDGMENT

Overconfidence - The pervasive tendency to be overconfident can lead to suboptimal behavior in every step of a good judgment process

- Overconfidence can lead to underinvesting in defining the problem and identifying fundamental objectives, the consideration of too few alternatives, or truncating or skipping an information search, all of which can lead to a suboptimal conclusion
PITFALLS AND BIASES IN JUDGMENT

Confirmation - Tendency and related potential judgment bias primarily affects steps 3 gather and evaluate information & step 4 of reaching a conclusion of the judgment process

- Human tendency is to seek and overweight confirming information in the information gathering and evaluation steps and to favor conclusions that are consistent with our initial beliefs or preferences
PITFALLS AND BIASES IN JUDGMENT

**Anchoring** - Tendency and related potential judgment bias primarily affects step 3 to gather and evaluate information of the judgment process

- In gathering and evaluating information, it is human nature to anchor on an initial value and adjust insufficiently away from the value in making our final assessment
Availability - Tendency limits alternative considered or information gathered to those alternatives or information that readily come to mind

- The availability tendency can have particular influence on steps 2 consider the alternative and step 3 gather and evaluate the information of the judgment process
HOW TO IMPROVE DECISION MAKING

• Evaluate management’s business strategies and whether management is taking necessary steps to achieve strategic goals

• Evaluating risk, including the risks of fraud, and assessing management’s internal control and other responses to those risks

• Reviewing and approving financial budgets and forecasts
HOW TO IMPROVE DECISION MAKING

• Reviewing the adoption of new technology

• Evaluating management’s plans to address the risks of various potential disasters
**CASE STUDY: TITANIC**

Titanic was one of the greatest maritime disasters of all time that took place on April 14/15 of 1912. Over 1,500 lives perished in the disaster.

In 1900, travel from Europe to America was exclusively by ship. Competition of business was fiercely competitive.
COMPETITION FOR PASSENGERS

Competition for passengers drove passage prices down so the number of passenger a liner could carry and its speed in crossing the Atlantic Ocean were two crucial factors in making a profit for owners.

Crossing speed became a rivalry between the two companies with the prestige of the record for fastest crossing being used as a marketing tool.

British government gave the “Blue Riband Award” to the holder of the fastest crossing record across the Atlantic.
“BLUE RIBAND” AWARD

- Cunard Line held Blue Riband Award for 22 years
- Cunard Line’s Mauritania made the fastest crossing in 1907
- Mauritania was not only the fastest passenger ship on the Atlantic run, but also one of the biggest and most luxurious
- White Star were desperate to build a liner that could compete with Mauritania


WHITE STAR’S COMPETING STRATEGIES

• Wanting to be the fastest ship to cross the Atlantic

• Build a luxurious ship to attract the very richest and most demanding passengers

• Build a large enough ship to accommodate many second and third class passengers because the profit lay with the number of passengers on the ship

• They wanted the safest ship crossing the Atlantic and be able to claim the ship was unsinkable
SHIP BUILDING IN 1900

Ships built with steel that had a high sulphur content which tends to make the steel brittle.

Brittleness increases as the temperature drops and the North Atlantic can be very cold with icebergs.

Riveting steel plates instead of welding which is a weaker technique.
SEVERAL COMPETING FACTORS

Speed is the result of several factors

Length of the hull
- Longer the ship’s waterline, the faster she goes
- Broad beamed heavy ship will be slower

Width of the hull
- Narrower hull will be faster
- Narrower hull has less room for luxury
SEVERAL COMPETING FACTORS

Speed is the result of several factors

Weight of the ship
- More powerful engine required more boilers
- More powerful engines needed more space for coal

Space for Cabins
- More space each cabin has, fewer the total cabins on ship
- Ship was only 890 feet with 3,500 passengers

Space for Lifeboats
- More lifeboats meant less room for paying customers
- Passenger ships only required to carry 16 lifeboats regardless the number of passengers
Operation of doors would be automatic or controlled manually from the bridge.

Second inner hull would protect the outer hull if breached.

Telegraph used to advise the ship of weather conditions and hazards to navigation.

Life boats to be used only as a last resort.
CONTRIBUTING FACTORS TO DISASTER

• Demand for use of telegraph by passengers handicapped Titanic in receiving emergency warnings of icebergs

• Crow’s nest did not have a set of binoculars

• Calm waves and dark opaque surface of ice made it hard to see icebergs

• Ship was going too fast through icebergs

• Rudder damaged when leaving South Hampton’s dock
RESPONSE TO THE DISASTER

First lifeboat to leave could have held 68 men, but only had 12 passengers

Fourth officer reported prematurely to Captain Smith that there was little damage to the ship

Water tight doors to individual compartments were not water tight and flood water began to float to next compartment

Crew tried to have passengers fill lifeboats, but reluctant passengers went back to their compartments, the smoking room, or the gymnasium

Damage caused by the collision with the iceberg affected five water-tight compartments

As each compartment filled, the bow sank deeper, and water flowed over the top of the bulkheads. With five compartments flooded, the ship could not survive
GROUP ACTIVITY

Were there conflicts in the strategic plans of the Titanic?

What were the safety concerns of the Titanic?

What critical information did the crew of the Titanic lack in their response to the iceberg?

What were the breakdowns of communication on board?

What were the causes of the sinking of the Titanic?

What could have been done differently?
SIX STEP APPROACH TO ERM

1. Risk Identification
2. Risk Assessment
3. Risk Analysis
4. Implementation
5. Monitoring
6. Evaluation
1. RISK IDENTIFICATION

The process of taking inventory of all risks in an organization and defining the potential risk event, the causes to that risk event, and the potential outcome if that risk event were to occur.

Focus not only on hazard or operational risks, but also strategic, financial, reputational, compliance, environmental, human capital and technology, market, and supply chain risks.
Define where the source of a potential risk event is coming from; Inside or Outside the organization. Establishing risk categories helps to identify the sources of a risk event.
STRATEGIC RISK CATEGORIES

- Innovation Risk
- Customer Risk
- Market Risk
- Investor Risk
- Brand Risk
- Planning Risk
- Partnering Risk
- Supply Chain Risk
- R&D Risk

1 Risk Identification
FINANCIAL RISK CATEGORIES

- Financial Market Risk
- Credit Risk
- Liquidity Risk
- Interest Risk
- Hedging Risk
- Valuation Risk
- Inflation Risk
- Foreign Investment Risk
- Asset Risk

1 Risk Identification
OTHER RISK CATEGORIES

- Reputational Risk
- Environmental Risk
- Third Party Risk
- Economic Risk
- Project Risk
- Investment Risk
- Other

Risk Identification
## Risk Identification

<table>
<thead>
<tr>
<th>RISK CATEGORY</th>
<th>IDENTIFIED RISKS</th>
</tr>
</thead>
</table>
| **Financial**       | • Debt management  
                      |   • Decline in air travel  
                      |   • Economic downturn    | • Fuel price volatility  
                      |   • Investment management process  
                      |   • Revenue concentration |
| **Human Capital**   | • Adequacy of employee skill set  
                      |   • Aging workforce  
                      |   • Employee recruitment | • Employee retention  
                      |   • Employee screenings  
                      |   • Knowledge transfer |
| **Legal / Regulatory** | • Labor strike  
                      |   • Environmental concerns  
                      |   • FAA changes | • Fraud  
                      |   • Regulatory changes |
| **Operational**     | • Aging infrastructure  
                      |   • Airfield operations safety  
                      |   • Business continuity planning | • Competition  
                      |   • Inclement weather  
                      |   • Inefficient contracting process |
| **Strategic**       | • Lack of authority levels  
                      |   • Media exposure/public relations  
                      |   • Pandemic  
                      |   • Terrorism | • Airline concentration  
                      |   • Change in Wright Amendment  
                      |   • Outsourcing strategy |
| **Reputational**    | • Media Inquiries | • Public Relations |
| **Technology**      | • Data privacy/loss | • Systems failure |
IDENTIFY SUBCATEGORIES

1. Risk Identification

- **Hazard Risk**: Safety risk of increased slips, trips and falls accidents occurring in the organization.

- **Operational Risk**: Human capital risk of 25% of workforce is eligible for retirement in the next 5 years.

- **Financial Risk**: Credit risk of 35% of commercial loans will default in the third quarter.

- **Strategic Risk**: Sole supplier of a raw material has been acquired by competitor.
EXISTING & EMERGING RISK

Look not only at existing risks, but also the emerging risks to the organization.

- What new business processes have been added to the organization?
- What changes have been made in the organizational chart?
- What are some external risks that could impact the organization like economic, environmental, societal, geopolitical, and technological?
Know Where You Stand

1. Risk Identification

Meet with senior management to define the strategic goals of your organization.

Review the mission and vision statements of the organization.

Define the expectations of internal and external stakeholders.
This conflict caused the quality control of manufacturing to suffer.

Case in point – the Cidra Plant in Puerto Rico made 20 drugs under unhealthy conditions that lead to a $750 million FDA fine.

One of GSK’s strategic goals was to sell safe and effective prescription medication.

Another goal was to increase profitability by outsourcing manufacturing to other parts of the world.

GlaxoSmithKline – A study in conflicting strategic goals
NEXT STEPS

1. Risk Identification

- Identify the risk management objectives to support the strategic goals of the organization
- Review the Risk Policy of the organization
- Create a SWOT Analysis (Strengths, Weaknesses, Opportunities, and Threats) reviewing the internal and external content of the organization
SWOT ANALYSIS

1. Risk Identification
RISK IDENTIFICATION ACTIVITIES

**Brainstorming**
Can effectively generate lots of ideas of potential risk scenarios that could take place

**Structured Interviews**
Uses a risk survey or questionnaire to ask specific questions related to different types of potential risk events facing a particular risk owner or risk center

**Top Down / Bottom Up Approach**
ESTABLISH RISK CRITERIA

1. Risk Identification

- External and internal parameters for managing risk in an organization
- Responsibilities of risk owner
- Risk centers assigned to risk owner
- Determine critical risks in the organization
- Prioritize the critical risks from greatest to least
University of California has developed an ERM Work Plan for its employees. Within the context of campus/medical center’s mission, the management team establishes strategic goals, selects strategy and aligns ERM objectives to the strategic plan. The enterprise risk management framework is geared to achieving objectives in four categories:

- **Strategic**
  - High-level goals, aligned with and supporting their mission

- **Operations**
  - Effective and efficient use of their resources

- **Reporting**
  - Reliability of reporting

- **Compliance**
  - Compliance with applicable laws and regulations
KPIs help you understand how well you are performing in relation to your strategic goals and objectives. In order for KPIs to be effective, they need to be measurable.

- % of customer attrition
- % of employee turnover
- Rejection rate
- Meantime to repair IT problems
- Customer order waiting time
- Profitability of customers by demographic segments
NUCLEAR INDUSTRY KEY PERFORMANCE INDICATORS

• **U.S. Nuclear Power Plants** have dramatically improved performance in many areas of plant operations including:

  - Operating capacity
  - Unplanned automatic reactor trips
  - Collective radiation exposures

• The development and management of key performance indicators has been the key driving performance at nuclear power plants.
INDUSTRY PROGRESS WITH THE USE OF KPI

• **Capacity Factors**
  • 1980s typical nuclear reactor produced 63% of maximum possible power
  • Today nuclear reactors produce around 91%

• **Unplanned Automatic Shutdowns**
  • 1980s there were about seven per year
  • Today median unplanned automatic shutdown rate value is zero

• **Collective Radiation Exposures**
  • Since 1980s collective radiation exposure has been reduced by a factor of six
  • BLS shows that it is safer to work at nuclear power plant than in manufacturing or real estate or finance sectors
FUTURE KPIS IN NUCLEAR INDUSTRY

- Human Performance Indicators
  - 80% of accidents involve culture, management and or human performance
  - Strong need to measure human performance
- Emergency Planning
- Work Management
- Corrective Actions
- High Radiation Area Controls
- Unplanned Dose Events
- Radioactive Material Found Outside
KRIs are leading indicators of risk to business performance. They give us an early warning to identify a potential event that may harm continuity of the activity or project.

<table>
<thead>
<tr>
<th>% of suppliers with no business continuity management</th>
<th>% of mission-critical recovery plans not exercised with the last 12 months</th>
<th>% turnover of mission-critical IT personnel</th>
<th>% of mission-critical business processes with a backup/recovery architecture</th>
</tr>
</thead>
</table>

1 Risk Identification
SUPPLY CHAIN DISRUPTION

Some sources of risk are not directly under the control of the organization, but are a part of their supply chain.

March 11, 2011 - A massive tsunami devastated the coastline of Japan.

GM, who may have had a competitive advantage to their Japanese competitors, outsourced a transmission from a manufacturer in Japan for its Chevy Volt.
CASCADING EFFECTS

1. Business is interrupted
2. Loss of employees
3. Quality and productivity goes down
4. Competitor takes market share due to business interruption

Risk Identification
SUPPLY CHAIN ASSESSMENT

• Determine critical supplies and suppliers
• Supplier profit & loss mapping
• Calculate financial loss scenarios
• Alternatives if supply chain fails
• Review mitigation plans
• Recommend improvements
SUPPLY CHAIN RISK HEALTH CHECK

• Do you know who your critical suppliers are, and how much their failure would impact your company’s profits?

• Have you fully mapped your critical supply chains upstream to the raw material level and downstream to the customer level?

• Do you integrate risk management processes into your supply chain?
SUPPLY CHAIN RISK HEALTH CHECK

• Do you record details of supply chain incidents and recovery, to avoid future incidents?

• Do your tier 1 suppliers have business continuity plans that are stress tested for viability?

• Have you provided risk training to procurement/supply chain teams?

• Is risk on the agenda at performance meetings with strategic suppliers?
SUPPLY CHAIN RISK HEALTH CHECK

• Are there systems for measuring financial stability of critical suppliers?

• Are tier 1 production facilities and logistic hub exposed to natural catastrophe?

• Is proactive supply chain risk management integrated into your enterprise risk management approach and business resiliency planning
TOOLS AND TECHNIQUES

1. Risk Identification

- Conduct HAZOP and "what if" scenarios
- Define business or process drivers of the organization
- Review what is said about your organization on social media networks
- Interview Subject Matter Experts
- Personal Inspections
- Flowcharts
- Financial Statements
- Loss Histories
- Questionnaire & Risk Survey
CREATE A RISK REGISTER

1. Risk Identification
   - Identify a potential risk event
   - Categorize the risk event
   - Identify potential causes
   - Assign risk owner
   - Determine the likelihood
   - Determine the consequences
   - What is the financial impact
   - Risk treatment
   - Date to review risk
   - Create A Risk Register
### SAMPLE RISK REGISTER

#### Risk Identification

<table>
<thead>
<tr>
<th>ID</th>
<th>T/O</th>
<th>Title</th>
<th>Probability</th>
<th>Schedule</th>
<th>Consequence</th>
<th>Score</th>
<th>Mitigation</th>
<th>Title</th>
<th>Probability</th>
<th>Schedule</th>
<th>Consequence</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T</td>
<td>Number of rigs just 31 against 54 agreed</td>
<td>VH (90%)</td>
<td>VH (60)</td>
<td>VL (2)</td>
<td>H</td>
<td>36</td>
<td>Reduce</td>
<td>VH (90%)</td>
<td>VH (60)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td>Dozing solids</td>
<td>VH (90%)</td>
<td>VL (60)</td>
<td>VL (2)</td>
<td>H</td>
<td>72</td>
<td>Avoid</td>
<td>VH (90%)</td>
<td>VH (60)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>3</td>
<td>T</td>
<td>Tubing tongs</td>
<td>VH (90%)</td>
<td>VL (60)</td>
<td>VL (2)</td>
<td>H</td>
<td>72</td>
<td>Transfer</td>
<td>VH (90%)</td>
<td>VH (60)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>4</td>
<td>T</td>
<td>Organizational changes</td>
<td>VH (90%)</td>
<td>L (7)</td>
<td>L (2)</td>
<td>M</td>
<td>18</td>
<td>Reduce</td>
<td>VH (90%)</td>
<td>VH (60)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>5</td>
<td>T</td>
<td>Supplies</td>
<td>L (75%)</td>
<td>H (20)</td>
<td>VL (2)</td>
<td>M</td>
<td>12</td>
<td>Transfer</td>
<td>VL (5%)</td>
<td>VL (25)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>6</td>
<td>T</td>
<td>Review and Approvals</td>
<td>H (60%)</td>
<td>H (20)</td>
<td>VL (2)</td>
<td>M</td>
<td>28</td>
<td>Reduce</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>7</td>
<td>T</td>
<td>Maintenance</td>
<td>VH (90%)</td>
<td>N (0)</td>
<td>VL (2)</td>
<td>H</td>
<td>72</td>
<td>Avoid</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>8</td>
<td>O</td>
<td>Shift rigs</td>
<td>M (90%)</td>
<td>VH (2)</td>
<td>VL (2)</td>
<td>L</td>
<td>40</td>
<td>Exploit</td>
<td>VH (90%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>9</td>
<td>T</td>
<td>Weather</td>
<td>L (60%)</td>
<td>L (2)</td>
<td>L (2)</td>
<td>M</td>
<td>28</td>
<td>Avoid</td>
<td>H (60%)</td>
<td>L (7)</td>
<td>L (7)</td>
<td>L</td>
</tr>
<tr>
<td>10</td>
<td>T</td>
<td>Injuries</td>
<td>L (60%)</td>
<td>L (7)</td>
<td>L (7)</td>
<td>M</td>
<td>28</td>
<td>Avoid</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>11</td>
<td>T</td>
<td>Information and communication</td>
<td>VH (90%)</td>
<td>VH (60)</td>
<td>VL (2)</td>
<td>H</td>
<td>72</td>
<td>Avoid</td>
<td>VH (90%)</td>
<td>VH (60)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>12</td>
<td>T</td>
<td>Equipment availability</td>
<td>M (90%)</td>
<td>VH (120)</td>
<td>VL (2)</td>
<td>L</td>
<td>40</td>
<td>Avoid</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>13</td>
<td>T</td>
<td>Material, Equipment performance reliability</td>
<td>VL (5%)</td>
<td>N (20)</td>
<td>N (2)</td>
<td>M</td>
<td>4</td>
<td>Transfer</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>14</td>
<td>T</td>
<td>Service, Technical performance reliability</td>
<td>L (50%)</td>
<td>H (20)</td>
<td>M (2)</td>
<td>M</td>
<td>12</td>
<td>Reduce</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>15</td>
<td>T</td>
<td>Environment exposure</td>
<td>H (60%)</td>
<td>H (20)</td>
<td>M (2)</td>
<td>L</td>
<td>28</td>
<td>Avoid</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
<tr>
<td>16</td>
<td>T</td>
<td>Maintenance training</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>H</td>
<td>8</td>
<td>Avoid</td>
<td>VL (5%)</td>
<td>VL (2)</td>
<td>VL (2)</td>
<td>L</td>
</tr>
</tbody>
</table>

#### Risk Details

<table>
<thead>
<tr>
<th>ID</th>
<th>Title</th>
<th>Description</th>
<th>Effect</th>
<th>RBS</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of rigs just 31 against 54 agreed</td>
<td>During a presentation on 22nd of March to the Management it has been agreed that the project will get 54 rigs, approximately 45 would work on new completions and 9 rigs would have to go back and perform interventions on wells</td>
<td>1st delay of schedule in September expected, effect on project total 4 - 6 month</td>
<td>Threat: Difficult</td>
<td>Open</td>
</tr>
</tbody>
</table>

Selected risk: 1 - Number of rigs just 31 against 54 agreed
SAMPLE RISK HEAT MAP

WYCRR Heat Map 2011
Not Protectively marked

Relative Impact

Relative Likelihood

Risk Identification
RISK TORNADO DIAGRAM

1. Risk Identification
2. RISK ASSESSMENT

Risk Assessment
A process to determine the cause of the risk event, the risk event itself, and the impact and the velocity of the risk event.

Quantitative Assessment
Measures the value of the impact

Root Cause Analysis
Find the root cause of a potential risk event

Qualitative Assessment
Recognizes the source of the risk event
### CAUSES OF RISK

#### Three Basic Causes

<table>
<thead>
<tr>
<th>Physical causes</th>
<th>Human causes</th>
<th>Organization causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A tangible or material item failed in some way.</td>
<td>People did something wrong or did not do something required.</td>
<td>A system, process or policy that people use to make decisions in doing their work is faulty.</td>
</tr>
<tr>
<td>Brakes stop working on a car</td>
<td>No one check the condition of the brakes</td>
<td>No procedure for checking the maintenance of the cars</td>
</tr>
</tbody>
</table>
ROOT CAUSE ANALYSIS

- Management Oversight and Risk Tree
- The "5-Whys"
- Barrier Analysis
- Change Analysis
- Parent Analysis
- Fault Tree Analysis
- Failure Mode Effect Analysis
- Fish-Bone Diagram or Ishikawa Diagram
- Casual Factor Tree Analysis

Methods

2
Risk Assessment
Fault Tree Analysis is a deductive method of logic moving from the general to the specific that examines the possible conditions that may lead to or influence an undesirable or desirable event.

- Very useful in examining the possible conditions that may lead to a desired or undesired event.
- Top event will be placed at the top of the tree and all subsequent events that lead to the main event will be placed as branches.
- Symbols provide a pictorial representation of the event and how it interacts with other events on the tree.
SYMBOLS OF FAULT TREE ANALYSIS

A RECTANGLE INDICATES AND EVENT TO BE ANALYZED.

A CIRCLE INDICATES A BASIC FAULT EVENT OR PRIMARY FAILURE OF A COMPONENT. IT REQUIRES NO FURTHER DEVELOPMENT.

THE HOUSE IS USED FOR EVENTS THAT NORMALLY OCCUR IN THE SYSTEM. IT REPRESENTS CONTINUED OPERATION OF THE COMPONENT.

THE DIAMOND IS USED FOR NON PRIMAL EVENTS WHICH ARE NOT DEVELOPED FURTHER FOR LACK OF INFORMATION OR INSUFFICIENT CONSEQUENCE.

THE OVAL IS USED TO REPRESENT A CONDITION. IT DEFINES THE STATE OF THE SYSTEM THAT PERMITS A FAULT SEQUENCE TO OCCUR. IT MAY BE NORMAL OR RESULT FROM FAILURES.

THE AND GATE SERVES TO INDICATE THAT ALL INPUT EVENTS ARE REQUIRED IN ORDER TO CAUSE THE OUTPUT EVENT.

THE OR GATE SERVES TO INDICATE THAT ONE OR MORE OF THE INPUT EVENTS ARE REQUIRED TO PRODUCE THE GATED EVENT.
EXAMPLE FAULT TREE

Hot Water Heater Explodes

Pressure Relief Valve Fails
  - Relief Valve Frozen
  - Relief Valve Disch Line Plugged
    - RV Line Frozen
    - RV Line Crimped
    - Pipe Plug Installed in line

High Water Temperature
  - Temp Regulator Fails
  - High Temp Cut-off Fails
RISK ASSESSMENT USING ROOT CAUSE ANALYSIS

Two Approaches

Proactive method where RCA is used to forecast or predict probable risk events before they occur (Bonneville Power Administration)

After a risk event has occurred (Investigation of the Macondo Well Explosion)

Without RCA, one cannot determine what an effective corrective action for the defined problem will be.

The nature of RCA is to identify all contributing factors to a problem or event
CASE STUDY: MACONDO WELL EXPLOSION
**CASE STUDY: MACONDO WELL EXPLOSION**

<table>
<thead>
<tr>
<th><strong>Risk Assessment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Decisions to change well design appeared to have been made by BP Macondo team without any formal risk analysis or internal expert review</td>
</tr>
<tr>
<td>Lack of proper risk communication between Haliburton and BP’s management processes to ensure that the cement was adequately tested</td>
</tr>
<tr>
<td>BP did not share important information with its contractors, or even sometimes internally with members of its own team and they didn’t share critical risk information with BP</td>
</tr>
<tr>
<td>Individuals often found themselves making critical decisions without a full appreciation for the context in which they were making decisions or without recognition that the decisions they were making were critical to the entire operation</td>
</tr>
</tbody>
</table>
INVESTIGATION FOUND EIGHT KEY FINDINGS FOR ACCIDENT

1. The annulus cement barrier did not isolate the hydrocarbons
2. The shoe track barriers did not isolate the hydrocarbons
3. The negative-pressure test was accepted although well integrity had not been established
4. Influx was not recognized until hydrocarbons were in the riser
5. The blow out preventer (BOP) emergency mode did not seal the well
6. The fire and gas system did not prevent hydrocarbon ignition
7. Diversion to the MGS resulted in gas venting onto the rig
8. Well control response actions failed to regain control of the well
Bonneville Power Administration is a self-financed governmental agency that was established in 1937 by the Bonneville Project Act.

BPA funds its activities through the sales of power that is generated by entities in the Federal Columbia River Power System which includes 31 federal dams, one nuclear power plant and other nonfederal power generation facilities.

Operational risks posed by fluctuations in river flows and electric market prices, net revenues that result from underlying surplus or deflect energy positions are inherently uncertain.
BPA STRATEGIC DECISION PROCESS

• BPA’s strategic goals are clearly defined, measurable, and reflect the agency’s level of tolerance for risk taking activities

• Existing and emerging risks are dynamically identified and managed

• Decisions and policy are based on a complete and shared understanding of objectives and a robust consideration of risks

• Management of risk-taking activities is an integral part of BPA culture
BPA USES ROOT CAUSE ANALYSIS

Hybrid of two RCA methods: the 5 Whys and the Fishbone diagram

- **5 Whys** is a question-asking method used to explore the cause/effect relationships underlying a particular problem, with the goals of determining a root cause of a defect or problem

- **Fishbone Diagram** identifies many possible causes for an effect or problem and groups causes into categories of: people, methods, machines, materials, measurements, and environment
SAMPLE FISHBONE DIAGRAM

- **Transport**
  - Cost of Transport
  - Access to premises
  - Transport of goods and services

- **Premises**
  - Security
  - Access
  - Assessment
  - Maintenance
  - Geography
  - Capacity
  - Fitness for purpose

- **People**
  - Resistance
  - Training
  - Redeployment
  - Contract review
  - Role review

- **Finance**
  - Savings
  - Devolving budget
  - Management
  - Sustainability
  - Profits/Income Question
  - Economies of scale

- **I.T.**
  - Resilience
  - Contingency
  - Support
  - Training
  - Resource
  - Messaging

- **Clients**
  - Consultation
  - Information Involvement

---

Risk Assessment
RCA HELPS DETERMINE PROPER MITIGATION STRATEGIES

• **BPA** realizes that to select the correct risk controls and risk responses to a particular risk event, it’s necessary to focus on root causes of the potential risk event instead of treating just the symptoms of the risk event.

• By doing this, an organization is more likely to be effective in mitigating the effects of risks around the event and on achieving their ERM performance goals that align to the BPA strategic goals.
QUALITATIVE ANALYSIS

Positive Fault Tree Analysis
Will identify the events necessary to achieve a top desired event for example no accident in manufacturing facility

Negative Fault Tree Analysis
Constructed to show those events or conditions that will lead to a top undesired risk event such as a fire in the manufacturing facility
GROUP ACTIVITY

Construct a basic fault tree analysis for a desired event of no accidents

- What safety resources must be available?
- What human resources need to be available?
- What kind of safety training must be available?

Construct a basic fault tree analysis for an undesired event of a fire

- Ignition source
- Fuel source
- Sufficient Oxygen
When the likelihood of an event is known and a probability value has been assigned, then analysis of these events on a fault tree will also yield quantitative results.

Financial impact can be added to each stage of the Fault Tree Analysis.

Risk correlation can be demonstrated.
STATE OF WASHINGTON’S NINE STEP APPROACH TO ROOT CAUSE ANALYSIS

1. Verify the incident and define the problem
2. Map a timeline of events
3. Identify critical events
4. Analyze the critical event’s cause and impact
5. Identify root causes
6. Support each root cause with evidence
7. Identify and select the best solutions
8. Develop recommendations
9. Track implementation of solutions
3. RISK ANALYSIS

Understand
Risk aggregation and risk correlation in an organization’s risk portfolio

Determine
The interrelationship of risk exposures to a potential risk event

Formulate
The best risk strategies for the organization from risk assessments
DHS plays a leadership role in the Nation’s unified effort to manage risk working across the homeland security enterprise which includes Federal, state, local, tribal, territorial, non-governmental and private sector entities. As part of the analysis in their ERM program, DHS used an integrated risk management structure to address uncertainty inherent in their complex mission space, and help make the tough decisions necessary to keep the nation resilient and secure with limited resources.
DHS uses Influence Diagrams to analyze the interrelationships and interdependencies of risks across the enterprise.
DHS uses analytic tools like RAPID-Risk Assessment Process for Informed Decision-Making to manage risks associated with their strategic goals.
DATA ANALYSIS TO DHS

Data analysis allows for more transparent and defensible decisions.

Contextualizes homeland security threats, showing which are the most likely and which have the highest impact.

Helps prioritization decisions among terrorism, natural disasters, cyber, pandemics, and border security hazards.

Provides a performance measure for programs across the homeland security mission space.

Identifies opportunities for reducing risk exposures of potential risk events.

Allows for understanding of the impact of combined risk exposures taking place at the same time.
4. IMPLEMENTATION

Implementation - incorporating an ERM structure, practices, and strategies to fulfill the goals of the organization.

- ERM framework
- Risk controls
- Risk champions and risk centers
- Risk communication structure
- Crisis management protocol
- Business Continuity
Management is responsible for implementing appropriate controls to reduce risk and to achieve operational objectives.
RISK CHAMPIONS AND RISK CENTERS

**Risk Champions**

- Accountable for ensuring accuracy within their department or business unit around the identification, assessment, management and monitoring of risk
- They are the eyes and ears of risk information for the risk manager who is in charge of assessing risk across the enterprise
- Not necessarily responsible for performing the actual risk management activities

**Risk Center**

- A department or unit within the organization charged with the risk exposures that are related to their duties and responsibilities
RISK CHAMPIONS AND RISK CENTERS AT INTUIT

CRO and ERM program office have ownership and accountability for Intuit’s ERM program and drive Intuit’s ERM capabilities.

Ownership and accountability for identified risks are shared by executive and business unit level leaders.

Risk communication is not only to report progress, but also so that business units can share and leverage risk knowledge.

“When we talk about growth strategies for the company, we talk deliberately about both risks and opportunities.”

Janet Nasburg, Chief Risk Officer at Intuit
Annual assessments cycles have been integrated with the strategic planning process:

- Began tracking key performance indicators for each strategic risk
- Established monitoring and reporting processes for risk trending and risk activities
- Now have robust ERM program to monitor strategic, operational, market / business and financial and compliance risks
RISK COMMUNICATION STRUCTURE

**Simple State System**
The event can be resolved through routine decisions

**Complicated State System**
The event is more difficult to resolve than a simple system, but it is not unusual

**Complex State System**
The event is unusual, and potentially critical to the organization

**Chaotic State System**
The event is a dramatic, unforeseen situation that threatens the organization’s survival
CRISIS MANAGEMENT

Messages to all stakeholders must be clear, address the pressing issues and engage all the stakeholders to be diligent in plans of recovery.

Communication must demonstrate that senior management is committed to maintain an environment of transparency in decision making.

Risk communication becomes a key component in surviving a crisis situation.
SF ALL-HAZARDS STRATEGIC PLAN

• The City and County of San Francisco’s Strategic Plan is intended to enhance the City’s ability to detect, prevent, respond to and recover from acts of terrorism and natural and human-caused disasters through development of a single common preparedness vision and strategy.

• The Strategic Plan was development in close collaboration with the City’s emergency management and homeland security stakeholders.

• There are 20 strategic goals.
STRATEGIC GOALS FOR EMERGENCY MANAGEMENT AT SFC

• **Strategic Goal #14** Improve chemical, biological, radiological, nuclear and explosive/weapons of mass destruction/hazardous materials response and decontamination capabilities

  • **Objective #1** Conduct assessments of City’s and region’s chemical, biological, radiological, nuclear explosive, weapons of mass destruction/hazardous material response & decontamination resources and capabilities including State and Federal assets

  • **Objective #2** Test the chemical, biological, radiological, nuclear, and explosive/weapon of mass destruction/hazardous materials response and decontamination resources & capabilities through exercise, specially the ability to provide pre-hospital care at the incident & ability to decontaminate the deceased
KPIS FOR STRATEGIC GOAL # 14

- List of regional chemical, biological, radiological, nuclear and explosive/weapons of mass destruction/hazardous materials response resources is developed

- Plan and procedures for mass decontamination are incorporated in the City’s Emergency Response Plan

- Number of exercises held that test mass decontamination capabilities
STRATEGIC PLAN
IMPLEMENTATION ROADMAP

• Roadmap document describes specific activities or milestones that the City will undertake to accomplish each of the strategic goals

• Development of a work plan and actual implementation of the strategic goals will be the responsibility of the coordinating lead agencies

• City departments are involved in scores of improvement efforts targeted at the operational and tactical level
ELEMENTS OF CONTINUITY PLAN

- Statement of acceptable level of functioning
- Recovery time objectives, resources needed and potential failure points
- Task and activities required
- Structure to support the plan
- Supporting documentation and information
- Procedures and processes
- Description of personnel duties and responsibilities
- Describe interdependencies among the various departments

4 Implementation
IDENTIFY CRITICAL ACTIVITIES

- Proactive risk management
- Identify vulnerabilities and minimize uncertainty
- Appropriate focused attention
- Efficient resource and capital allocation
- Informed decision making
BUSINESS IMPACT ANALYSIS

- Key Business Process Analysis
- Business Value Chain
- Supply Chain Mapping & BI Modeling Output
- Mission Critical Activities
BUSINESS CONTINUITY MANAGEMENT

• Determine mission critical activities

• Evaluation of GAP between recovery and customer loyalty

• Safety and security plans

• Emergency plans

• Crisis management plans

• Audit & testing of existing plans
Monitoring involves communication of risk both upstream and downstream across the organization. It includes periodic reporting and follow-up on the risks by various levels of management, risk committees, and internal auditors.

KPIs and KRIs are a valuable way to monitor key risks linked to improved cash flows and earnings.
TOOLS USED FOR MONITORING

- **Spreadsheets**
  - Like risk registers

- **Balanced Scorecards**
  - Captures company’s strategy by
    - Customer
    - Internal Processes
    - Innovation and Learning
    - Financial

- **Dashboards**
  - Pictorial reporting of risks

- **Governance Risk and Compliance Software**
  - Focus on audit and compliance

- **Enterprise Risk Management Software**
  - ERM focus on software solutions
BALANCED SCORE CARDS AT UNIVERSITY OF CALIFORNIA

Divisions and units within the campuses and locations will sometimes need to define goals and objectives as a first step in their implementation of ERM.

**The Customer Perspective**
emphasizes satisfying the needs of customers.

**The Financial Perspective**
emphasizes the stakeholder concern about how efficient and effective the unit is at using its resources.

**The Internal Business Perspective**
Emphasizes excellence at performing internal processes and in employee competencies.

**The Innovation & Learning Perspective**
emphasizes continuous improvement and the creation of value.
The “Scorecard” measures the achievement of objectives.

Begin by making a list for each objective of what is measured currently and what else could be measured.

Try to limit the number of measures to no more than six per objective and be sure to measure results and desired outcomes, rather than processes. The measures you select will be your Key Performance Indicators.
# CRITICAL RISK: MITIGATION PLAN

## Critical Risk: Mitigation Plan

<table>
<thead>
<tr>
<th>Project name</th>
<th>Project Impact Phase</th>
<th>Project Impact Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK Identified by</td>
<td>PM</td>
<td>Impact/Trigger Date</td>
</tr>
<tr>
<td>Risk type/source</td>
<td>Risk Coordinator</td>
<td>Max Cost</td>
</tr>
<tr>
<td>Risk No.</td>
<td>Risk owner</td>
<td>Min Cost</td>
</tr>
<tr>
<td>Open date</td>
<td>Risk Score</td>
<td>Most likely Cost</td>
</tr>
<tr>
<td>Risk Statement</td>
<td>(3 C's format: Condition, Cause, Consequence)</td>
<td></td>
</tr>
</tbody>
</table>

### Closure Criteria/Closure Statement

<table>
<thead>
<tr>
<th>Closure Criteria/Closure Statement</th>
<th>Closure Date</th>
<th>Change Control Approved Yes or No (circle one)</th>
</tr>
</thead>
</table>

### Mitigation action (Preventive)

<table>
<thead>
<tr>
<th>Mitigation action (Preventive)</th>
<th>Actionee</th>
<th>Action Deadline date</th>
<th>Action Deadline phase</th>
</tr>
</thead>
</table>

### Contingency action

Use the chart below to show the risk score before and after mitigation.

![Risk Score Chart]

---

5 Monitoring
CASE STUDY: WALMART

Developed KPI and KRI metrics incorporated in a balanced scorecard.

Metrics used to track performance on risk and to determine the company’s progress in managing the risk.

Walmart also uses these metrics to determine the value added by the ERM process.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Response Time Metric</th>
<th>Visibility Metric</th>
<th>Productivity Metric</th>
<th>Shrinkage Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic value driver</td>
<td>x</td>
<td>function driven</td>
<td>x</td>
<td>function driven</td>
</tr>
<tr>
<td>Executive defined</td>
<td>x</td>
<td>function defined</td>
<td>x</td>
<td>function defined</td>
</tr>
<tr>
<td>Organization cascade</td>
<td>x</td>
<td>no</td>
<td>x</td>
<td>no</td>
</tr>
<tr>
<td>Enterprise standard</td>
<td>x</td>
<td>function specific</td>
<td>x</td>
<td>function specific</td>
</tr>
<tr>
<td>Quantifiable metric</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Based on valid data</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Easy to comprehend</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Relevant over time</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Provide context</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Empower user</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Promote positive action</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>KPI Status</td>
<td>KPI</td>
<td>Metric</td>
<td>KPI</td>
<td>Metric</td>
</tr>
</tbody>
</table>

Monitoring
6. EVALUATION

Ascertaining the strengths and weaknesses of the ERM program with regard to the organization’s strategic goals

Risk Optimization / Value Creation

Return on Investment

ERM’s Role in Governance
RISK OPTIMIZATION

Balance between taking on too much risk and not taking on enough risk to explore opportunities for growth

Explore various risk-return outcomes

Evaluate risk controls in place and decide the best use of financial resources to provide needed protection
Since 2003-2004 fiscal year, they have reduced their Cost of Risk by $493 million dollars.

Reduced the Cost of Risk from $18.46 per $1,000 of operating budget to $13.31 per $1,000 of operating budget.

Each year University of California holds an Annual ERM Summit focused on their continuous effort in improving their ERM program by reducing their Cost of Risk.
UNIVERSITY OF CALIFORNIA’S COST OF RISK

- **Cost of Risk** - Quantitative measurement of the total costs (losses, risk control costs, financing costs, and administrative costs) associated with the risk management function, as compared to a business's sales assets, and number of employees.

- The purpose of such a comparison is to determine whether the total costs of the risk management function are increasing, decreasing, or remaining constant as a function of the business's economic activity.
UNIVERSITY OF CALIFORNIA’S COST OF BORROWING

- **Cost of Borrowing**: On July 22, 2009, Standard & Poor’s (S&P) released a progress report regarding enhancement of its global rating process for non-financial companies by including enterprise risk management assessments in its rating.

- S&P has recognized UC for its ERM program and stated “The UC has implemented a system-wide enterprise risk management information system which, in our opinion, is a credit strength.”

- S&P gave UC a higher rating in Fall 2010 which is a $10 million dollar savings on their debt load.
UC CREATES EFFICIENCY

- The creation of automated reports within the ERMIS has increased workforce efficiency.
- Reduced the staff time spent in updating information provided monthly to University leadership
- More reliable information is updated more frequently
UC REDUCES REDUNDANCY

• Eliminating same or similar reports being developed and maintained with the benefit of shared knowledge at different divisions, departments, schools, campuses, medical center and other locations

• ERMIS enables sharing of analyses and information easily and efficiently across multiple different locations
Guidance principles for board risk oversight

Key drivers of success and risks in the company’s strategy
Crafting the right relationship between the board and its standing committees as to risk oversight
Establishing and providing appropriate resources to support risk management systems
Monitoring potential risks in the company’s culture and incentive systems
Developing an effective risk dialogue with management

National Association of Corporate Directors report, “Risk Governance: Balancing Risk and Reward”
GM’S EVOLVING BOARD
RISK GOVERNANCE

• Prior to August 3, 2010, GM had an Investment Fund Committee, which was dissolved and ultimately replaced with a Finance and Risk Committee

• This new committee focuses on two major objectives. Under finance section of the charter it focuses on the financial policies, strategies, and capital structure. In the risk management section of the charter, it focuses on the company’s risk management strategies and policies
RISK GOVERNANCE RESPONSIBILITIES

• GM’s Finance and Risk Committee Charter states that the risk assessment and risk management are the responsibility of the company’s management.

• The Committee’s risk responsibility is one of oversight and review.

• Composition of Finance and Risk Committee is comprised of two insiders, its CEO, its Vice President of Strategy and Business Development and three independent directors.
COordinating with Audit Committee

- The independent directors include the chairs of both the audit and executive compensation committee.

- Audit Committee and Finance and Risk Committee are receiving all information necessary to permit them to fulfill their duties and responsibilities with respect to oversight of the risk assessment and risk management.

- Executive Compensation Committee also on the Finance and Risk Committee, this ensures that GM’s compensation arrangements are designed to provide incentives that are consistent with the interests of GM’s stockholders.

6 Evaluation
The Executive Risk Committee provides the Board of Directors with:

- A structure that provides the board with the appropriate information that defines the firm’s risk profile.
- A system that provides an audit of the effectiveness of the risk management process.
- A system that affords an evolving understanding of key risks to the company.

“Boards are now finally asking management about the nature of the risk information process in place. Boards want to gather information about new or emerging risks and the extent to which these risks require a more in-depth analysis. This is being done to ensure future opportunities and threats to the company’s performance are appropriately managed.”

John Bugalla, James Kallman, Chris Mandel and Kristina Narvaez

The Corporate Board
THANK YOU FOR YOUR PARTICIPATION

PRESENTED BY
KRISTINA NARVAEZ
PRESIDENT & CEO
ERM STRATEGIES, LLC
www.erm-strategies.com
ZURICH FINANCIAL SERVICES GROUP

- Insurance-based financial services provider
- Fourth-largest Property-Casualty Insurer
- Global network of subsidiaries and offices in North America and Europe as well as in Asia Pacific, Latin America and other markets
- Approximately 60,000 employees
- Serving customers in more than 180 countries and territories
ERM OBJECTIVES AT ZURICH

• Protect the capital base by monitoring that risks are not taken beyond the Group’s risk tolerance level

• Enhance value creation and contribute to an optimal risk-return profile by providing the basis for an efficient capital deployment

• Support the Group’s decision-making processes by providing consistent, reliable and timely risk information

• Protect Zurich’s reputation and brand by promoting a sound culture of risk awareness and disciplined and informed risk taking
QUALITATIVE METRICS
AT ZURICH INSURANCE

Qualitative Method
- Total Risk Profiling
- Proprietary tool for risk (Zurich Risk Room)
- 3-5 years time horizon

Operational Risk & Control
- Integrated Risk & Control framework and methodology
- Top Down Scenarios
- Operational Risk Assessments
- Issue Register
- Loss Events
QUANTITATIVE METRICS AT ZURICH INSURANCE

Risk Tolerance
- Defines and informs risk limits
- Takes a shareholder view
- Capital-at-Risk
- Earnings-at Risk
- Financial flexibility

Risk-Based Capital
- Amount of capital based on an assessment of risks that a company should hold to protect customers against adverse development
- Sets target capitalization at AA level
- Takes a policyholder view (1/2000 years)
TOTAL RISK PROFILING

• Identify potential risk issues
• Develop risk scenarios
• Assess current rating
• Define risk priority boundary and prioritize risk scenarios
• Develop improvement actions for the prioritized scenarios
• Key risks and actions are loaded into Planview
DEVELOP RISK SCENARIOS

**Vulnerability**
- What could happen?
- Where could it happen?
- What were the controls?

**Trigger**
- How could it happen?
- Why would it happen?
- When would it happen?

**Consequences**
- How big would it be?
- How bad would it be?
- How much would it be?
CASE STUDY-LEGO GROUP

LEGO Group developed risk management in four steps:

• **Step 1 Enterprise Risk Management** includes financial, operational, hazard, and strategic risks

• **Step 2 Monte Carlo Simulation** were added to understand the financial performance volatility and drivers behind it to integrate risk management into the budgeting and reporting process
STRATEGIC RISK MANAGEMENT AT LEGO

- **Step 3 Active Risk and Opportunity Planning** where business projects go through a systematic risk and opportunity process as part of preparing the business case before final decisions about the projects have been made.

- **Step 4 Preparing for Uncertainty** where management tries to ensure that long-term strategies are relevant for and resilient to future changes that may very well differ from those planned for.
RETURN ON INVESTMENT

• 20% average growth from 2006 to 2010 in a market with 2% to 3% growth
• Grown from 17% return on sales to 31% on sales in 2010

• Reasons for the Turnaround
  • Monte Carlo Simulation has shown us what uncertainty is
  • Risk appetite has shown us what the uncertainty is
  • Making bigger supply chain investments
  • Integration of risk management into strategic planning
CASE STUDY-SAFeway

Safeway is a grocery store chain that is a Fortune #60 company with sales of $40 billion in 2010

- Significant operating companies are VONS, Dominick’s, Randall, Tom Thumb, Genuards, Pavillions, Carrs, and Safeway
- GroceryWorks.com is their online grocery and delivery services
- Blackhawk Network Holding Inc. which is a third provider of third-party gift and related prepaid cards
- Casa Ley-Safeway has a 49 percent ownership of Casa Ley which operates 137 food and general merchandise stores in Western Mexico
RISK IDENTIFICATION

Why is risk identification so important to Safeway?

• Shareholders demand that management adequately identify all material risks facing the organization

• Auditing protocols are beginning to require organizations to report risks in a forward looking context

• Market analysts are demanding that corporate management strengthen their risk disclosure capabilities
RISK IDENTIFICATION

- Financial and operational managers are increasingly being held accountable for managing their operations and risks on a portfolio basis.

- Failure to anticipate, analyze and possibly exploit risk opportunistically could place the company at a strategic disadvantage.
RISK PARADIGM AT SAFEWAY

• Risk is capital

• **Risk has both an upside and downside potential.** The question is which is most valuable to the corporation?

• Risks do not exist in isolation. They should be managed that way. Risks are better managed in portfolios

• There exists an “efficient frontier” upon which risk and reward are reflected in risk assumptions and transfer decisions
STRATEGIC RISKS AT SAFEWAY

• What are the material risks to the organization?

• How does the corporation reduce the volatility of risk?

• Are the types of internal risk mitigation techniques appropriate to the risks the organization faces?
STRATEGIC RISKS AT SAFEWAY

• If we think of risk as capital, what is the economic value of risk transfer vs. risk assumption/exploitation upon shareholder value?

• If the organization understands it’s risks and insurance was never invented, what risk mitigation methods would a corporation use?

• How are their risks exploitable to create a competitive advantage?

• How does Safeway create new value to the organization?
HORIZONTAL INTEGRATION AT SAFEWAY

• **Horizontal integration** in marketing is generally considered to be defined as a company's efforts to buy out various operations of the same kind, that is, the competition.

• Conversely the advantage of this is to capture markets by running those added companies as a part of the main corporation's larger central operation.

• For example, at present, Safeway is the controlling concern in the Carrs food stores in Alaska, Randalls and Tom Thumb stores in Texas, Vons in Southern California and Nevada, as well as Genuardi's in the Philadelphia.
SAFETY’S VERTICAL INTEGRATION

• **Vertical integration** is when a corporation takes on the nature of other services required to assist in the marketing of the corporation's output, thus gaining savings in areas such as packaging and transportation.

• For example, Safeway has vertically integrated its business by operating transportation and warehousing operations within their parent companies structure.
SAFEWAY’S VERTICAL INTEGRATION

• Safeway owns its own transportation system

• Operating their own trucking line helps to get control of costs and distribution concerns, this is one of the benefits to this kind of vertical integration.

• Another benefit is found in bulk buying power. With a warehouse, larger loads of goods can be bought at lower prices.
SAFEWAY’S VERTICAL INTEGRATION

• This bulk buying concept is well known in the grocery industry and relates to the idea of economies of scale.

• The savings found in buying in bulk can be passed along to the consumer making the store more competitive. In the past, at certain times of the year, some products may have been straight hauled by the grower to a local store.
SAFEWAY’S VERTICAL INTEGRATION

- **Straight hauled goods** are typically fruits or vegetables that have short marketing windows.

- A **marketing window** is the period of time during which the product traditionally sells or moves the best.

- A marketing window may also refer to the period of time a product can be maintained for sales before spoilage destroys it. This is also known as shelf life.
SAFEWAY’S VERTICAL INTEGRATION

• Pumpkins are a good example, the marketing window for this highly specialized (and perishable) product is in October.

• To save on marketing time and over the dock charges a produce grower may contact the store and ship direct (straight hauled) rather than through the warehouse.

• Christmas Trees are another example of a commodity with a short marketing window.
STRATEGIC LOCATION OF STORES

• The location for stores such as these are typically found on the basis of marketing models that take into account, the core population, business location and other issues associated with the demographic of a market area or tributary.

• Ultimately the company makes a decision on the size of the store based on the market tributary it can draw from. It is not chance that a nearly comparable size super store (Albertsons) is not far from this Safeway.

• Competitive linkages are normally planned within the store's locational strategies which, by the way, are in the "top secrete" file drawer in the store's headquarters.
STRATEGIC LOCATION OF STORES

• Basically, there is a demographic gravitational attraction that this store will reflect based on the functions it offers, its size and the marketing model that's used to establish the store's location.

• The drawing power of a store is influenced by the number of competing stores in the area and the demographics of the population of the market in which it draws from.
GROUP ACTIVITY

• What are some of the horizontal risk challenges for Safeway?

• What are some of the vertical risk challenges for Safeway?

• What are some of the risk challenges in the location of Safeway stores?