Risk Management: The Known and Unknown

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Department of Professional and Occupational Regulation

Promoting Regulatory Excellence

Goals and Objectives

- Introduce Risk Management as a “best practice” business process
- Take you through the development of a Risk Management Plan
- Give you some tools for “Your” Risk Management Program

Today’s Journey

- Introduction
- Risk Management by the numbers *
- Questions

* Includes exercises and the use of risk management templates
Who are Sharon and Steve?

Sharon G. Verry

Sharon serves as the Risk Manager for the Commonwealth of Virginia's Department of Professional and Occupational Regulation (DPOR). This department regulates over 30 professions and occupations, licenses over 300,000 regulants, and has an operating budget of over 20 million dollars. Prior to joining DPOR, she served as the Risk Management Audit Specialist for the Commonwealth's Auditor of Public Accounts. Before state government service, Sharon served for six years as the State Secretary/Treasurer and Business Manager for the state office of a national non-profit organization. Her education includes a Bachelor of Science in Finance with a concentration in Risk Management and a Master of Business Administration. She holds the Associate in Risk Management and Associate in Risk Management for Public Entities designations.

Steven L. Arthur

Steve serves as the Deputy Director for Administration and Finance for the Commonwealth of Virginia’s Department of Professional and Occupational Regulation (DPOR). During his 15 years with DPOR he also served as both a Contracting Officer, and as the Administrator for the Tradesman Certification Program. Before state government service, Steve retired from active duty with the United States Army. During his twenty years of military service at installations around the world, he utilized his extensive training in logistics and contracting. Steve holds a commercial multi-engine airplane and helicopter pilot's license, and has flown over three thousand hours of accident free flight in military helicopters and airplanes in the United States, Korea, Central America, and the Middle East. He has a Master’s Degree in Management Science (Complex Logistic Systems), and is a Virginia Contracting Officer (VCO).
We Manage Risk Every Day...

- Logical, consistent, disciplined approach to the future’s uncertainties
- A step beyond faith and luck
- Links an event to its cause

Examples: Buckling a seat belt; using a child safety car seat; obtaining auto and health insurance; crate-training a puppy; carrying an umbrella...the list goes on and on

Risks are a part of life

- Risks are a part of life;
- Some risks are unavoidable;
- They offer value, excitement, adventure, and challenge;
- We can’t get to a new place without taking risks!

“Twenty years from now you will be more disappointed by the things that you didn’t do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore. Dream. Discover.”

- Mark Twain
HOWEVER...We still want to make sure we have a GPS, charts, provisions, a radio, and a life boat!

Why do we respond to some risks??????

An “Every Day” Example

Why do you carry an umbrella some days, but not every day?

We Identify Risks

❖ Is rain in the forecast today?
❖ What’s the chance of rain?
❖ How much or how long might it rain?
❖ What time is it supposed to rain?
❖ What clothes am I wearing?
❖ What would be the impact of me getting wet?
❖ Do I own an umbrella or would I need to buy one?
❖ Do I have room to carry an umbrella?
We Consider Risk Factors

- High probability of rain
- Forecast predicts it will rain at the time I will be outside
- The clothes I’m wearing will be damaged by the rain
- Hair, if rained on, may FRIZZ
- If exposed to the rain I might melt (this seems far fetched, but for some, it may not be)

We Consider Risk Responses

Taking into consideration probability and impact...

A. I could just take a chance! (retain the risk)
B. I can stay inside today (avoid the risk)
C. I can send someone else in my place (transfer the risk)
D. I can carry my umbrella (reduce the risk)

We Consider Options and Make Decisions

- We utilize the data we’ve collected to make a decision
- The process used to manage the risks involved in going out in the rain is similar to the process used to manage other risks in both our personal lives and those affecting organizations

Let's look at the process of managing risks!
Risk Management Program - The Journey

And your guide is......

Sharon Verry

Risk Management - History

Traditional Risk Management
– Workers' Compensation Laws - 1905
– Formal insurance widely recognized – 1920’s
– Risk theories develop to include upside and downside of risk
– Professional insurance managers become risk managers

Important Events in History
– The Titanic; Three Mile Island; Exxon Valdez; September 11, 2001; Enron

Other Contributing Events
– World Wars; earthquakes; typhoons; cyclones; hurricanes; plane crashes; other financial debacles
**Risk Management - History**

- Financial risk concerns
  - COSO Internal Control-Integrated Framework published in 1992
- Terrorism and Enron – no entity is “too big” for collapse
- Operational and strategic planning

**Enterprise Risk Management (ERM)**

- Provides methods and processes to manage risks and seize opportunities
- Provides a framework for risk management relevant to the organization’s strategies and objectives

**Enterprise Risk Management (ERM)**

- Identify and proactively address risks and opportunities
- Protect and create value for stakeholders:
  - Owners
  - Employees
  - Customers
  - Regulators
  - Society
ERM Roles in the Organization

- Director, CEO level - overall risk culture, scope, and implementation
- Risk Manager – facilitates and coordinates the enterprise risk management process
- Senior and operational managers (and all employees) – identify risks, develop mitigating strategies or controls, ensure monitoring

Scope of Risk Management

- Determined by Director/Senior Management
- Risks related to Strategic Objectives; Financial Reporting; Operational Risk in Daily Activities other than Financial Reporting
- Risks related to a specific project – Example: New Licensing System Implementation
- Combination of risks

Value of Enterprise Risk Management

“Value is created, preserved, or eroded by management decisions in all activities, from setting strategy to operating the enterprise day-to-day”.

- COSO ERM Framework, Institute of Internal Auditors, 9/2004
ERM - Proactive approach to reduce risk
**Value of Enterprise Risk Management**

- Enables management to:
  - Deal effectively with potential future events that create uncertainty
  - Respond in a manner that reduces the likelihood of negative outcomes and increases the likelihood of positive outcomes

**Sharon’s Great Risk Management “Challenge”**

**Risk Management: Formal Process**

**Step 1 – Risk Identification**
**Step 2 – Risk Assessment**
**Step 3 – Determine Risk Response**
**Step 4 – Develop & Implement Mitigating Strategies**
**Step 5 – Monitor**
**Step 6 – Review & Modify Plan as Necessary**
Step 1 - Risk Identification

“As we know, there are known knowns. There are things we know we know. We also know there are known unknowns. That is to say, we know there are some things we do not know. But there are also unknown unknowns; the ones we don't know we don't know.”

- Donald Rumsfeld

Step 1 – Risk Identification

- Documentation of the material threats to the organization’s achievement of its objectives
- Documentation can include a risk matrix to collect data in an organized manner
- Risk identification may be linked to organization’s strategic objectives, a specific project, and/or divisional tasks and goals

Resources for Risk Identification

- Stakeholders
- Benchmarking
- Lessons learned from previous projects, other divisions, or other organizations
- Enterprise Risk Management texts, publications, articles
- Compliance issues – statutes, regulations, policies
Step 1 – Risk Identification
- Risk Manager facilitates risk identification meetings
- Opportunity for section to be proactive and represent its interests in achieving objectives
  - Profit
  - Compliance
  - Customer Service
  - Morale
  - Others

New Licensing System - Example
- What tasks does my section perform that can be affected by the new system?
- What can go wrong with each task?
- How does my section interrelate with other sections?
- How does the new system affect existing operations?
- What can go wrong if we don't coordinate?

New Licensing System - Example
- What can go wrong related to implementing the new system?
- Where do we expect problems to occur? (the Known Unknowns)
- Where might unexpected problems occur? (The unknown unknowns)
- What issues will affect other issues?
Internal Processes to Identify Risk

- Brainstorming
- Surveys/Questionnaires
- Flowcharting
- Comparison of procedures to compliance documents
- "Water cooler" conversations – these can be underestimated!

Risk Identification Matrix Example

<table>
<thead>
<tr>
<th>Task Related to EAGLES PROJECT</th>
<th>Potential Risk Associated with Failure to Complete Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complete all testing and ensure corrections are approved prior to go-live date. Trainers cannot train staff responsible for data entry in absence of go-live at the &quot;go-live&quot; which will be delayed.</td>
<td>The entry of data is prone to errors due to lack of training.</td>
</tr>
<tr>
<td>2. The staffing levels to meet all performance standards. Training is inadequate to meet published performance standards.</td>
<td>Training is inadequate to meet published performance standards.</td>
</tr>
<tr>
<td>3. Forms developer modifies web applications to facilitate data entry in VERSA. The developer is not notified of required changes to the web applications resulting in the wrong application being available to customers online.</td>
<td>The developer is not notified of required changes to the web applications resulting in the wrong application being available to customers online.</td>
</tr>
</tbody>
</table>

Risk Identification Exercise

PICNIC
Risk Management: Formal Process

Step 1 – Risk Identification

**Step 2 – Risk Assessment**

Step 3 – Determine Risk Response

Step 4 – Develop & Implementing Mitigating Strategies

Step 5 – Monitor

Step 6 – Review & Modify Plan as Necessary

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Importance of Stakeholder Inclusion

Stakeholder #1

H2O Risk Impact:
Low (Negligible)?
Medium (Minor/Moderate)?
High (Critical)?

\[ \text{Frequency Index} \times \text{Severity Index} = \text{RISK IMPACT} \]
Importance of Stakeholder Inclusion

Stakeholder #2
H₂O Risk Impact:
Low (Negligible)?
Medium (Minor/Moderate)?
High (Critical)?

\[ \text{Risk Impact} = \text{Frequency Index} \times \text{Severity Index} \]

AND...Outliers are important!

Risk Impact Measurement

- **Risk** is the combination of the likelihood (frequency) and the consequence (severity) of a specified event being realized.

- The combination of frequency and severity (consequence) gives us a measure of loss (harm) or gain associated with an activity.

Risk Impact Measurement

- Opportunity – the "upside" of risk
- Risk also results in positive outcomes
- Though traditional risk management focused on identifying and measuring "threats" or negative outcomes of events, ERM focuses on both the "downside" AND the benefits of risk taking
Frequency/Probability

Luck Favors the Prepared

“It is remarkable that (probability) which began with the consideration of games of chance should have become the most important object of human knowledge.”

- Pierre Simon Laplace

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Frequency/Probability

Likelihood is expressed as a frequency or a probability. Frequency is a measure of the rate at which events occur over time.

How about a litter of chocolate labs? Two chocolate lab parents:

<table>
<thead>
<tr>
<th>Punnett Square for BbEe sire bred to BbEe dam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dam can contribute:</td>
</tr>
<tr>
<td>BE</td>
</tr>
<tr>
<td>BE</td>
</tr>
<tr>
<td>Bk</td>
</tr>
<tr>
<td>Be</td>
</tr>
<tr>
<td>Be</td>
</tr>
<tr>
<td>Bk</td>
</tr>
<tr>
<td>Bk</td>
</tr>
<tr>
<td>Bk</td>
</tr>
<tr>
<td>Bk</td>
</tr>
</tbody>
</table>

Sire can contribute:

BbEe | BbEe | BbEe | BbEe

All combinations are assumed to be equally likely, so if probability were followed exactly, we would get:

<table>
<thead>
<tr>
<th>Black</th>
<th>Chocolate</th>
<th>Yellow with brown nose and light eyes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBEE</td>
<td>1 pup in sixteen or 6.25% black</td>
<td></td>
</tr>
<tr>
<td>BbEE</td>
<td>2/16 or 12.5% black</td>
<td></td>
</tr>
<tr>
<td>BBEE</td>
<td>2/16 or 12.5% black</td>
<td></td>
</tr>
<tr>
<td>BbEE</td>
<td>4/16 or 25% black</td>
<td></td>
</tr>
<tr>
<td>bbEE</td>
<td>1/16 or 6.25% chocolate</td>
<td></td>
</tr>
<tr>
<td>BbEe</td>
<td>(1/4 of 6.25%) chocolate</td>
<td></td>
</tr>
<tr>
<td>BbEe</td>
<td>(1/4 of 6.25%) chocolate</td>
<td></td>
</tr>
<tr>
<td>BbEe</td>
<td>(1/4 of 6.25%) yellow</td>
<td></td>
</tr>
<tr>
<td>BbEe</td>
<td>(1/4 of 6.25%) yellow</td>
<td></td>
</tr>
<tr>
<td>BbEe</td>
<td>(1/4 of 6.25%) yellow</td>
<td></td>
</tr>
</tbody>
</table>
Frequency/Probability

Let's assume that the mail is delivered late one out of every five days.

Thus, the probability that the mail will be delivered late is 20%, or a probability index of 0.20.

Frequency/Probability Index

<table>
<thead>
<tr>
<th>Frequency Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 - 0.10</td>
<td>Improbable: Very unlikely the risk will occur</td>
</tr>
<tr>
<td>0.11 - 0.40</td>
<td>Remote: Unlikely the risk will occur</td>
</tr>
<tr>
<td>0.41 - 0.60</td>
<td>Occasional: Equal likelihood that the risk will occur (or not occur)</td>
</tr>
<tr>
<td>0.61 - 0.90</td>
<td>Probable: Likely the risk will occur</td>
</tr>
<tr>
<td>0.91 - 1.00</td>
<td>Frequent: Very likely the risk will occur</td>
</tr>
</tbody>
</table>

Severity

Chocolate lab ownership can host a variety of risks, such as the risk that oral fixation will lead to destruction of property and a threat to the pet's health.
Severity

- Health of pet – physical and mental
- Cost of surgery
- Cost of pillow
- Time off from work
- Cost of special recovery diet
- Future considerations/ restrictions

Severity

Severity is the value assigned to the consequences or outcome of failing to achieve system life cycle objectives.

Severity Index

1 = Negligible
2 = Minor
3 = Moderate
4 = Serious
5 = Critical
## Risk Measurement Matrix

<table>
<thead>
<tr>
<th>Risk Impact</th>
<th>Probability of Occurrence</th>
<th>Negligible</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Critical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improbable</td>
<td>0.01 - 0.10</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Critical</td>
</tr>
<tr>
<td>Rare</td>
<td>0.11 - 0.40</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Occasional</td>
<td>0.41 - 0.60</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Probable</td>
<td>0.61 - 0.90</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Frequent</td>
<td>0.91 - 1.00</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

## Risk Impact Measurement

### Remote
- Probability of Occurrence: 0.11 - 0.40
- Impact: Low
- Risk: Low
- Occurrence: 0.11 - 0.40
- Impact: Low
- Risk: Low

### Occasional
- Probability of Occurrence: 0.22 - 0.80
- Impact: Medium
- Risk: Medium
- Occurrence: 0.22 - 0.80
- Impact: Medium
- Risk: Medium

### Probable
- Probability of Occurrence: 0.61 - 0.90
- Impact: Medium
- Risk: Medium
- Occurrence: 0.61 - 0.90
- Impact: Medium
- Risk: Medium

### Frequent
- Probability of Occurrence: 0.91 - 1.00
- Impact: High
- Risk: High
- Occurrence: 0.91 - 1.00
- Impact: High
- Risk: High
Risk Management: Formal Process

Step 1 – Risk Identification
Step 2 – Risk Assessment

**Step 3 – Determine Risk Response**
Step 4 – Develop & Implement Mitigating Strategies
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Step 6 – Review & Modify Plan as Necessary

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**Step 3: Agency Risk Response**

Risk Response Options:

- Avoid the risk
- Accept the risk
- Reduce the risk
  - Control
  - Reduce
- Transfer the risk

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**Step 3: Agency Risk Response**

Based on:

- Risk appetite – the amount of risk an entity is willing to accept in pursuit of objectives
- Risk tolerance – the amount of risk (or loss) an entity can tolerate in pursuit of objectives
- Risk Management Culture
- Tone from the Top!
### Risk Response - Avoidance

**Prohibit, stop or eliminate**

- **Redefine objectives:**
  - High level of defects in production of Widget #1; remove from line and no longer produce

- **Corporate policies, limits and standards:**
  - Prohibit specific types of investments, purchases, etc.

### Risk Response – Acceptance

- **Retain risk at its current level – take no action**
  - This involves accepting the loss when it occurs
  - All risks that are not avoided or transferred are retained by default
  - Viable strategy for small risks in which cost to mitigate is greater over time than the losses sustained
  - Includes risks that are so catastrophic that they either can't be mitigated or the cost to mitigate is infeasible
Risk Response – Reduction: Control

Reduce the likelihood of the undesirable event occurring.

Examples:

Risk – Staff make errors in processing and relay of information due to lack of training.
Control Activity – Plan training of all staff prior to contact with customers.

Risk – Fire causes extensive damage to facility.
Control Activity – Reduce risk by enforcing “no smoking” policy.

Risk Response – Reduction: Respond

Reduce the severity of the impact if the risk scenario occurs.

Examples:

Risk – Staff make errors in processing and relay of information due to lack of training.
Response Activity – Upon notice of errors, administer individual training.

Risk – Fire causes extensive damage to facility.
Response Activity – Reduce impact by installing sprinkler system.

Risk Response – Transfer

- Insurance
- Reinsurance
- Hedging
- Indemnification (hold harmless clauses)
- Outsourcing
**Risk Response**

<table>
<thead>
<tr>
<th>Risk Description</th>
<th>Index A</th>
<th>Index B</th>
<th>Potential Impact on Project</th>
<th>Exposure</th>
<th>Identification/Analysis Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.1</td>
<td>0.9</td>
<td>5</td>
<td>4.5 High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.2</td>
<td>0.99</td>
<td>3</td>
<td>2.97 High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.3</td>
<td>0.8</td>
<td>4</td>
<td>3.2 Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.4</td>
<td>0.6</td>
<td>1</td>
<td>0.6 Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.5</td>
<td>0.6</td>
<td>1</td>
<td>0.6 Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Risk Response Exercise**

**Risk Management: Formal Process**

Step 1 – Risk Identification
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**Step 4 – Develop & Implement Mitigating Strategies**
Step 5 – Monitor
Step 6 – Review & Modify Plan as Necessary
Step 4: Develop & Implement Mitigating Strategies

- Mitigating strategies are the efforts taken to reduce either the probability or consequences of a threat or event.
- Range from physical measures (security system, security fence) to financial measures (insurance, self-insurance).

- Designed to monitor and confirm.
- Designed to establish channel of accountability.
- Can result in “residual risk.”

Example:
- Fire suppression – sprinkler system
- Residual Risk – water damage

Licensing System Example:
- Potential Risk – Staff forget training instructions and cannot refresh their training due to a lack of written training materials.
- Mitigation - Formal training materials are stored on shared drive.
Step 4: Develop & Implement Mitigating Strategies

Licensing System Example:
Potential Risk – System “Go-live” dates do not consider factors like training, operational changes, fiscal issues and staffing, resulting in optimistic, “best case,” rather than realistic, “expected case” schedule leading to failure to meet project deadlines.

Mitigation – Project Manager solicits input from stakeholders and incorporates training, operational changes, fiscal issues, and staffing as deliverables in determining the “go-live” date.
Mitigating Strategies

<table>
<thead>
<tr>
<th>Frequency Index</th>
<th>Impact</th>
<th>Potential Impact</th>
<th>Exposure</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>0.9</td>
<td>5</td>
<td>4.5</td>
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<td>0.99</td>
<td>3</td>
<td>2.97</td>
<td>High</td>
</tr>
</tbody>
</table>

Risk Mitigating Strategies Exercise

I think the storm will miss us?

Risk Management: Formal Process

Step 1 – Risk Identification
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**Step 5 – Monitor**
Step 6 – Review & Modify Plan as Necessary
Step 5: Monitoring

- Based on channel of accountability for risk mitigation
- Confirmable – required action or task can be verified

Step 5: Monitoring

New Licensing System Example:

- Potential Risk - Lack of test plan for migration resulting in failure to perform migration tests that are important to validate and verify the system is set-up properly and functions correctly.

Step 5: Monitoring

Licensing System Example:

Mitigation –

- A formal Migration Test Plan is developed and maintained to assist in systematically testing the results of migration, and identifying and correcting any problems that might occur.
- This plan is published on the shared drive.
Step 5: Monitoring

Licensing System Example:

Monitoring –

- The development of the formal Migration Test Plan is assigned to an individual with a due date.
- Completion is confirmed to the Risk Manager to include file name and path of location on shared drive; updates to the plan are confirmed to the risk manager.

Risk Management: Formal Process

Step 1 – Risk Identification
Step 2 – Risk Assessment
Step 3 – Determine Risk Response
Step 4 – Develop and Implement Mitigating Strategies
Step 5 – Monitor
Step 6 – Review & Modify Plan as Necessary
Step 6: Review and Modify Plan

“Living” document

Risk Matrix Example

Step 6: Review and Modify Plan

- Through monitoring, identify areas requiring modification
- Document “Realized Risks”
- Projects – Document “Lessons Learned”
**Realized Risks**

- Risks become realized when we experience an event resulting in negative consequences.
- Realized risks should be reported to the Risk Manager immediately.
- Frequency index becomes “1.0” or 100% probability.
- Risk Matrix – if severity index is above “1” or “negligible”, requires attention.

**Information and Communication**

- Important throughout the entire process.
- Identify, capture, and communicate pertinent information in appropriate form and time frame.
- Success relies on communication flows down, across, and up the organization.

**Summary: The Risk Management Process**
Managing Risk for Optimum Results

Thank you!

“Luck is the residue of design.”

- Branch Rickey
  (US baseball player, 1881-1965)

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