Council on Licensure,
Enforcement and Regulation

DENVER Colorado

2009 Annual Conference
September 10 - 12

Risk Management:
The Known and
Unknown

Presenters: Sharon Verry & Steve Arthur
Department of Professional and
Occupational Regulation

Promoting Regulatory Excellence

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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

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Today's Journey

- Introduction
- Risk Management by the numbers *
- Questions

* Includes exercises and the use of risk management templates

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Who are Sharon and Steve ?

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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.

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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).

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What is "my" relationship to risk management ?

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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

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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 ＼ .
☂ 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!

Slide 1

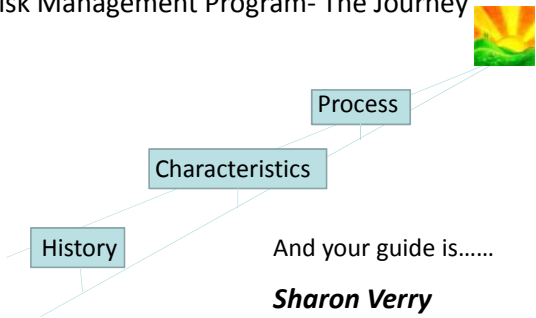**Risk Management Program- The Journey**

Process

Characteristics

History

And your guide is……

Sharon Verry

Slide 2

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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

Slide 3

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Risk Management - History

☁ 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

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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
  – COSO "Enterprise Risk Management-Integrated Framework" published in 2004

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

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Enterprise Risk Management (ERM)

• Identify and proactively address risks and opportunities

• Protect and create value for stakeholders:
  – Owners
  – Employees
  – Customers
  – Regulators
  – Society

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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

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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

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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

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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

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Sharon's Great Risk Management "Challenge"

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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

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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

Risk REF	Task Related to EAGLES PROJECT	Potential Risk Associated with Failure to Complete Task
S.1	Complete all testing and ensure corrections are approved prior to go-live date.	Trainers cannot train staff responsible for data entry in advance of go-live because key "bugs" in system have not been corrected timely; therefore, the entry of data is prone to errors due to lack of training.
S.4	Plan staffing levels to meet all performance standards.	Staffing is inadequate to meet published performance standards.
S.7	Forms developer modifies web applications to facilitate data entry in VERSA	Forms developer is not notified of required changes to the web applications resulting in the wrong application being available to customers online

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Risk Identification Exercise

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

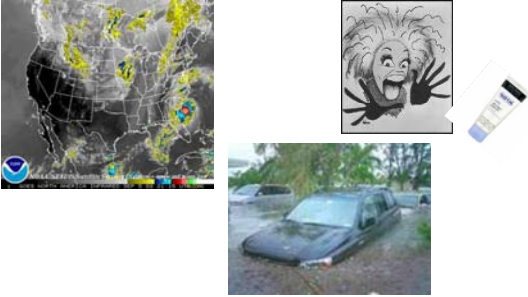**Step 2 – Risk Assessment**

Importance of Stakeholder Inclusion

Stakeholder #1

H_2O Risk Impact:
Low (Negligible)?
Medium
(Minor/Moderate)?
High (Critical)?

[Frequency Index] x [Severity Index]
= RISK IMPACT

Importance of Stakeholder Inclusion

Stakeholder #2
H_2O Risk Impact:
Low (Negligible)?
Medium
  (Minor/Moderate)?
High (Critical)?

[Frequency Index] x [Severity Index] = RISK IMPACT
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

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Slide 1

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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:

Punnett Square for BbEe sire bred to BbEe dam

*	Dam can contribute			
	BE	**bE**	**Be**	**be**
BE	BBEE	BbEE	BBEe	BbEe
bE	BbEE	bbEE	BbEe	bbEe
Be	BBEe	BbEe	BBee	Bbee
be	BbEe	bbEe	Bbee	bbee

(Sire can contribute)

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Frequency/Probability

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

BBEE (1 pup in sixteen or 6.25%) black
BbEE (2/16 or 12.5%) black
BBEe (2/16 or 12.5%) black
BbEe (4/16 or 25%) black
bbEE (1/16 or 6.25%) chocolate
bbEe (2/16 or 12.5%) chocolate
BBee (1/16 or 6.25%) yellow
Bbee (2/16 or 12.5%) yellow
bbee (1/16 or 6.25%) yellow with brown nose and light eyes.

Frequency/Probability

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

Event	Probability
A	$P(A) \in [0,1]$
not A	$P(A^c) = 1 - P(A)$
A or B	$P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $= P(A) + P(B)$ if A and B are mutually exclusive
A and B	$P(A \cap B) = P(A|B)P(B)$ $= P(A)P(B)$ if A and B are independent
given	$P(A|B)$

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

Frequency/Probability Index

Frequency Index	
0.01 - 0.10	Improbable: Very unlikely the risk will occur
0.11 - 0.40	Remote: Unlikely the risk will occur
0.41 - 0.60	Occasional: Equal likelihood that the risk will occur (or not occur)
0.61 - 0.90	Probable: Likely the risk will occur
0.91 - 1.00	Frequent: Very likely the risk will occur

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.

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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

RESOURCES STRAINED:
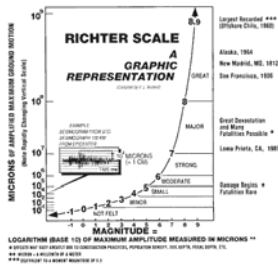Budget, Time, Health of Pet and Mental Health of Pet Owner

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Severity

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

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Severity Index

1 = Negligible

2 = Minor

3= Moderate

4= Serious

5 = Critical

Risk Measurement Matrix

Risk Matrix:		Potential Impact on Project				
Probability of Occurrence		Negligible 1	Minor 2	Moderate 3	Serious 4	Critical 5
Improbable	0.01 - 0.10	Low 0.01 - 0.10	Low 0.02 - 0.20	Low 0.03- 0.30	Medium 0.04 - 0.40	Medium 0.05 - 0.50
Remote	0.11 - 0.40	Low 0.11 - 0.40	Low 0.22 - 0.80	Medium 0.33 - 1.20	Medium 0.44 - 1.60	High 0.55 - 2.00
Occasional	0.41 - 0.60	Low 0.41 - 0.60	Medium 0.82 - 1.20	Medium 1.23 - 1.80	Medium 1.64 - 2.40	High 2.05 - 3.00
Probable	0.61 - 0.90	Medium 0.61 - 0.90	Medium 1.22 - 1.80	Medium 1.83 - 2.70	Medium 2.44 - 3.60	High 3.05 - 4.50
Frequent	0.91 - 1.00	Medium 0.91 - 1.00	High 1.82 - 2.00	High 2.73 - 3.00	High 3.64 - 4.00	High 4.55 - 5.00
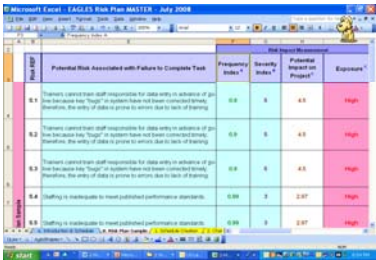
Risk Impact Measurement

Risk Measurement Exercise

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Risk Management: Formal Process

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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!

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AVOIDANCE	Avoid: Prohibit	Prohibit unacceptably high risk activities, transactions, financial losses and asset exposures through corporate policies, limit structures and standards.
	Avoid: Stop	Stop specific activities by redefining objectives, refocusing strategies and policies, or redirecting resources
	Avoid: Eliminate	Eliminate at the source by designing and implementing internal preventive processes
ACCEPTANCE	Accept: Retain	Retain risk at its present level, taking no further action
REDUCTION	Reduce: Control	Control risk through internal processes or actions that reduce the likelihood of undesirable events occurring to an acceptable level (as defined by management's risk tolerance)
	Reduce: Respond	Respond to well-defined contingencies by documenting an effective plan and empowering appropriate personnel to make decisions; periodically test, and if necessary, execute the plan
	Reduce: Diminish	Diminish the magnitude of the activity that drives the risk
TRANSFER (SHARE)		Transfer methods include insuring, reinsuring, hedging, securitizing, transferring (joint ventures), outsourcing, and indemnifying; generally not appropriate for this project

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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

NOTICE
NO SMOKING
UNLESS YOU'RE ON FIRE

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

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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

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Risk Response – Transfer

- Insurance
- Reinsurance
- Hedging
- Indemnification (hold harmless clauses)
- Outsourcing

Risk Response

Risk REF	Potential Risk Associated with Failure to Complete Task	Risk Impact Measurement				Identification/ Analysis Methods - Qualitative	Identification/ Analysis Methods - Quantitative	Agency Risk Response
		Frequency Index	Severity Index	Potential Impact on Project	Exposure			
S.1	Trainers cannot train staff responsible for data entry in advance of go-live because key "bugs" in system have not been corrected timely; therefore, the entry of data is prone to errors due to lack of training.	0.9	5	4.5	High	Interviews	not applicable	Reduce: Control
S.2	Trainers cannot train staff responsible for data entry in advance of go-live because key "bugs" in system have not been corrected timely; therefore, the entry of data is prone to errors due to lack of training.	0.9	5	4.5	High	Questionnaires	not applicable	Accept: Retain
S.5	Staffing is inadequate to meet published performance standards.	0.99	3	2.97	High	Walk-throughs	Cost/Benefit Analysis	Reduce: Respond
S.7	Forms developer is not notified of required changes to the web applications resulting in the wrong application being available to customers online	0.6	4	2.4	Medium	Mapping		Reduce: Control
S.8	Forms developer is not notified of required changes to the web applications resulting in the wrong application being available to customers	0.6	1	0.6	Low	Walk-throughs		Reduce: Control

Risk Response Exercise

Risk Management: Formal Process

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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)

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Step 4: Develop & Implement Mitigating Strategies

- 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

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Step 4: Develop & Implement Mitigating Strategies

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

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Step 4: Develop & Implement Mitigating Strategies

Licensing System Example:

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

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Step 4: Develop & Implement Mitigating Strategies

Slide 1

Mitigating Strategies

Risk Impact Measurement				Identification/ Analysis Methods - Qualitative [D]	Identification/ Analysis Methods - Quantitative [D]	Agency Risk Response [E]	Compensating Provisions/ Mitigation [F]
Frequency Index [A]	Severity Index [B]	Potential Impact on Project [C]	Exposure [C]				
0.9	5	4.5	High	Interviews	not applicable	Reduce: Control	Training will begin upon detection and correction of application "bugs" prior to "go-live"
0.9	5	4.5	High	Questionnaires	not applicable	Accept: Retain	
0.9	5	4.5	High	Checklists	not applicable	Reduce: Respond	Training will be reintroduced upon detection and correction of application "bugs" prior to "go-live"
0.99	3	2.97	High	Interviews	Cost/Benefit Analysis	Accept: Retain	
0.99	3	2.97	High	Walk-throughs	Cost/Benefit Analysis	Reduce: Respond	Contact DPB and request suspension of standards

Slide 2

Risk Mitigating Strategies Exercise

I think the storm will miss us?

Slide 3

Risk Management: Formal Process

Step 1 – Risk Identification

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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.

Monitoring

Risk REF #	Potential Risk Associated with Failure to Complete Task	Recommended Response	Suggested Mitigation Options	Monitoring
1.42	Form/application development is not on the project schedule making it impossible to monitor or expect completion	Reduce: Control	All forms and applications are included on the project schedule and related tasks are included in determining the timeline.	Records Management Director
			The project charter is updated to clearly identify scope and requirements of project. Any requirements leading to tasks are included in the project timeline.	Project Manager
1.47	Lack of planning and/or lack of implementation strategy results in ineffective implementation	Reduce: Control	Each area involved in the project implementation communicates tasks necessary for inclusion in the time line; before the project plan moves forward, it will be available for stakeholder review in a format accessible by all stakeholders.	Senior Management; Project Manager
			Project plan includes "go - no go" milestones as criteria to move forward.	Project Manager
1.49	Implementation plan does not include incremental "go-no go" milestones (criteria) to prevent failed start-ups	Reduce: Control	The EAGLES Oversight Committee member list is updated to reflect Phase 2 (current) membership and updated as changes occur. Members receive appropriate information regarding project milestones and risks of failure to meet milestones/criteria.	Project Director
			The EAGLES Business Support Team member list is updated to reflect Phase 2 (current) membership and updated as changes occur. Members receive appropriate information regarding project decisions and the role of the team.	Project Director
		Reduce: Control	Risk Manager facilitates identification of risks associated with failure to meet criteria/milestones as necessary.	Risk Manager

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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

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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

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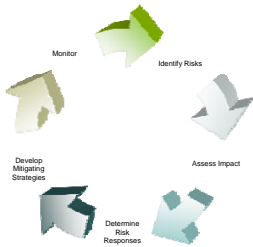
Summary: The Risk Management Process

Monitor
Identify Risks
Develop Mitigating Strategies
Assess Impact
Determine Risk Responses

Managing Risk for Optimum Results

Thank you!

"Luck is the residue of design."

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

Contact Information

☛ Sharon G. Verry, Risk Manager
Sharon.Verry@dpor.virginia.gov (804) 367-2681

☛ Steven L. Arthur, Deputy Director for Administration and Finance
Steve.Arthur@dpor.virginia.gov (804) 367-6061