ADVANCED LEVEL
OPERATIONAL RISK MANAGEMENT
In CAP’s Basic and Intermediate course you learned that Operational Risk Management is a logic-based, common sense approach to making calculated decisions on human, material and environmental factors associated with any type of activity. Or simply put, it’s a methodical, six-step process to manage inherent risk.

ORM does not replace regulations or allow CAP officers and cadets to disregard existing regulations. ORM fills the gap between real-world conditions and scenarios which are not already covered under regulation or law. Use of ORM does not guarantee mission success, but provides a standard methodology for avoiding or reducing mishaps.

If your have forgotten certain aspects of ORM, go back over the two previous courses before proceeding. Otherwise here is a refresher of the main points of ORM.
### The four principles of ORM are:
1. Accept no unnecessary risks
2. Make risk decisions at the appropriate level
3. Accept risk when benefits outweigh the cost
4. Integrate ORM into CAP at all levels

### The six-steps of ORM are:
1. Identify the Hazards
2. Assess the Risks
3. Analyze the Risk Control Measures
4. Make Control Decisions
5. Implement Risk Controls
6. Supervise and Review

### The 5M Model
1. Man
2. Media
3. Machine
4. Management
5. Mission

### The three levels of ORM
1. Time-Critical
2. Deliberate
3. Strategic
Advanced ORM

• This advanced course will enhance mission success by increasing your knowledge of the ORM process with the addition of some new items.

• Ten hazard identification tools are presented to guide you in uncovering areas of potential hazards as you work through ORM’s first step.

• The course will also explore steps two through six in greater detail.
Step 1. Identify Hazards

• To identify the hazards, you analyze the mission, list the hazards and list the causes.

• Perform hazard ID on all of CAP’s assets:
  ➢ Aircraft
  ➢ Vehicles
  ➢ Personnel
  ➢ Equipment

• Apply hazard ID to all operational levels:
  ➢ National
  ➢ Region
  ➢ Wing
  ➢ Group
  ➢ Squadron & Flights
Step 1. Identify Hazards

- These seven primary tools are the backbone in identifying hazards in any CAP operation.

- The Seven Primary Hazard ID Tools:
  
  A. Operations Analysis
  
  B. Preliminary Hazard Analysis
  
  C. “What If” Tool
  
  D. Scenario Process Tool
  
  E. Logic Diagram
  
  F. Change Analysis
  
  G. Cause & Effect Tool
Advanced ORM

Step 1. Identify Hazards
Operations Analysis Tool

• Used mostly by planners.

• Big picture look at what is expected to happen.

• Evaluates all elements of operation for potential sources of risk.

• Overcomes focusing on only a few intuitively identified risky operational areas.

• Itemizes chronological or sequential list of major events of an operation.

  ➢ Key to understanding which event(s) pose the highest level of risk.

  ➢ Each event can be broken down into sub-events.
Advanced ORM

Step 1. Identify Hazards
Operations Analysis Tool

- Key to understanding flow of events.

- Overcomes major weakness of only focusing on a few intuitively identified risky operational areas.

- Pen & Paper: Put steps of process on index cards or “sticky” notes.
  - Can rearrange as necessary.
  - Easily add or eliminate areas or events.

- Computer: Use project management software or create simple flow chart.
Advanced ORM

Step 1. Identify Hazards
Preliminary Hazard Analysis Tool

• Provides initial or broad overview of hazards present in overall operational flow.

• Briefly considers risk in every aspect.

• Can serve as only hazard ID tool if risk is low or routine.

• In higher risk operations, used to focus and prioritize risk issues.

• Used in virtually all ORM except time critical operations.

• Usually based on the operational analysis tool results
Step 1. Identify Hazards
Preliminary Hazard Analysis Tool

- Used to identify hazards requiring more in-depth hazard ID
- Easy to use and takes very little time

<table>
<thead>
<tr>
<th>Activity or Event</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>Hazard 1, Hazard 2</td>
</tr>
<tr>
<td>Step 2</td>
<td>Hazard 1</td>
</tr>
<tr>
<td>Step 3</td>
<td>Hazard 1, Hazard 2</td>
</tr>
</tbody>
</table>
Step 1. Identify Hazards

“What If” Tool

- One of the most powerful hazards ID tools.
- Designed to add structure to the intuitive and experiential expertise of operational personnel.
- Especially effective in capturing hazard data about failure modes.
- Typically used after the operations analysis and preliminary hazard analysis.
- Can be used on time critical applications.
Step 1. Identify Hazards
“What If” Tool

• Captures input of operational personnel in brainstorming-like environment.

  ➢ Participants should have through operation flow knowledge.

  ➢ Visualize expected operational flow in chronological order from beginning to end.

  ➢ Select a segment to focus on.

  ➢ Use “Murphy’s Law” to anticipate failures and worse-case scenarios.
Step 1. Identify Hazards
Scenario Process Tool

- Identify hazards using imagination and visualization to reveal unusual hazards.

- Construct a mental movie to walk thru events immediately ahead of and of the actual hazard.

- Visualize twice; once as they should be, then with worse credible scenarios.

- Ability to link two or more individual hazards makes it one of the best tools.
Step 1. Identify Hazards
Scenario Process Tool

• Entertaining, dynamic and motivating for even the most junior personnel.

• Best to follow flow of events outlined in the operational analysis tool.

• Can be only tool needed in time critical events.
Step 1. Identify Hazards
Logic Diagram

- Provides the maximum structure and detail of the primary hazards identification tools.
- It’s graphics captures and correlates the hazards data produced by the other tools.
- Tree-like structure establishes the connectivity and linkages that may exist between hazards.
- Most effective with complicated operations where hazards are interlinked in various ways.
- Excellent place to use the 5M Model – Interaction between Man, Machine, Media, and Management to produce Mission success.
Step 1. Identify Hazards
Logic Diagram

- The most comprehensive of the primary hazard identification tools.

- Three major types of logic diagrams
  - Positive diagram. Highlights factors that must be in place if risk is to effectively controlled.
  - Event diagram. Focuses on one event, often a failure identified with “what if” tool, and examines possible outcomes.
  - Negative diagram. Selects a loss event and analyses various hazards that could combine to produce that loss.
Step 1. Identify Hazards

Logic Diagram

Generic Logic Diagram

EVENT

PRIMARY CAUSE

SUPPORTING CAUSE

ROOT CAUSE

PRIMARY CAUSE

SUPPORTING CAUSE

ROOT CAUSE

PRIMARY CAUSE

SUPPORTING CAUSE

SUPPORTING CAUSE
Step 1. Identify Hazards

Logic Diagram

- Successful drive to SAREX

Man

- Physically Ready
- Mentally Ready
- Emotionally Ready
- Legally Ready

Machine

- Mechanically Ready
- Safety Equipment Ready

Media

- Weather Conditions
- Road Conditions

Management

- Road Structure
- Traffic Rules
- Enforcement

Example of Positive Logic Diagram
Step 1. Identify Hazards

Logical Diagram

Example of Negative Logical Diagram

Automobile Accident

- Speeding
- Road Rage
- Weather
- Inattention
- Road Conditions
- Reckless Driving
- Mechanical Failure
- Falling Asleep
Step 1. Identify Hazards
Change Analysis

• Used to analyze the hazard implications of planned or unplanned changes.

• Focuses only on the changed aspect of event.

• Compare the current situation with the previous one.

• Only tool needed if operation has been subjected to in-depth hazard analysis.

• Best accomplished using a simple worksheet.
### Advanced ORM

**Step 1. Identify Hazards**

**Change Analysis Worksheet**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Evaluated Situation</th>
<th>Comparable Situation</th>
<th>Difference</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>What</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety issues</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the process</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In sequence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Who</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Step 1. Identify Hazards

### Change Analysis Worksheet

<table>
<thead>
<tr>
<th>Factors</th>
<th>Evaluated Situation</th>
<th>Comparable Situation</th>
<th>Difference</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working Conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weather</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger Event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managerial Controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chain of Command</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard Analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To use the worksheet: Start at the top of the left column and work across. Consider the current situation. Compare it to a previous situation in a similar operation. Identify differences and determine if changes will cause any significant hazards. Modify worksheet to operation specifics.
Step 1. Identify Hazards
Cause & Effect Tool

- Brainstorming is used to identify causes, using the 5M Model, that may lead to a hazard.

- Uses the “Fishbone” or Ishikawa Diagram, after inventor Professor Kaoru Ishikawa of Tokyo University, a highly regarded expert in quality management.

  ➢ Illustrates hierarchical relationships between possible causes according to their level of importance.

  ➢ Can be drawn on flip chart or whiteboard.

  ➢ Variation of the Logic Diagram.
Step 1. Identify Hazards
Cause & Effect Tool

“Fishbone” Diagram
Step 1. Identify Hazards
Cause & Effect Tool

“Fishbone” Diagram

MAN

Improper Braking
Landing on nose gear
Hard Landing

MACHINE

Bad Bearing
Gear Misalign
Over Gross

MEDIA

Debris on Runway
Extreme Heat
Slippery Runway

MANAGEMENT

Improper Inspection
Improper Inflation
Incorrect Size

Tire Failure
A/C down
Step 1. Identify Hazards
Specialty Hazard ID Tool

- USAF identifies 14 specialty hazard ID tools used to augment the primary tools.

- Three are covered here:
  A. The Mapping Tool
  B. The Interface Analysis
  C. Mission Protection Tool
Step 1. Identify Hazards
Specialty Hazard ID Tool – A. The Mapping Tool

- Involves using road maps, terrain maps, airport diagrams, facility blueprints and system schematics to identify sources of hazards.

- Potential hazards are steep terrain, creeks and streams, winding mountainous roads, desert areas, flammables, and high voltage areas.

- Locate energy sources and other hazards on the map and note distance to operation and resources.
Step 1. Identify Hazards
Specialty Hazard ID Tool – A. The Mapping Tool

- Someone who has seen the map object is an invaluable resource to consult. An on-site inspection should occur before the operation begins.

- Incorporate these hazards into other Primary Hazard ID Tools
Step 1. Identify Hazards
Specialty Hazard ID Tool – B. The Interface Analysis

• Used to uncover potentially hazardous linkages or interfaces between unrelated activities.

• A SAR/SAREX at a local airport may impose hazards to the local airport operations, facilities and pilots.

• CAP operations at a airport not used before is a good cue to use the interface analysis and the Primary Hazard ID Change Analysis.
## Step 1. Identify Hazards

### Specialty Hazard ID Tool – The Interface Analysis

### Example Matrix

<table>
<thead>
<tr>
<th>Energy Interface</th>
<th>• Generators for Communication Trailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel Interface</td>
<td>• Mission Base Personnel</td>
</tr>
<tr>
<td></td>
<td>• Flight line Personnel</td>
</tr>
<tr>
<td></td>
<td>• Airport Personnel</td>
</tr>
<tr>
<td>Equipment Interface</td>
<td>• Aircraft</td>
</tr>
<tr>
<td></td>
<td>• Trailers</td>
</tr>
<tr>
<td></td>
<td>• Antenna</td>
</tr>
<tr>
<td></td>
<td>• Vehicles</td>
</tr>
<tr>
<td>Supply Interface</td>
<td>• Food Catering</td>
</tr>
<tr>
<td>Product Interface</td>
<td>• Mission Base Equipment</td>
</tr>
<tr>
<td>Information Interface</td>
<td>• ATC</td>
</tr>
<tr>
<td></td>
<td>• FBO</td>
</tr>
<tr>
<td>Bio-Material Interface</td>
<td>• None</td>
</tr>
</tbody>
</table>
Step 1. Identify Hazards
Specialty Hazard ID Tool – C. Mission Protection Tool

- Designed to focus on protection of the mission rather than on protection of personnel or other assets.

- Mitigates partially or completely stopping the mission by events that injure no one or cause no damage.

- Identify key components of mission continuity and success and what could interrupt them.

- Has no specific method or worksheet and is characterized by its focus.
Step 1. Identify Hazards
Specialty Hazard ID Tool – C. Mission Protection Tool

- Examples to consider that may prevent missions from proceeding are:
  - Computers or Internet service not available.
  - CAP Forms, weather reports, personnel contact information
  - Spare parts not available for resources.
  - Aircraft & vehicle tires, backup radios
  - Emergency at intended airport or FBO preventing setting up mission base.
Step 2. Assess the Risk

Risk is assessed based on exposure, severity, and probability in the order of most likely to least likely to happen using the risk assessment matrix.
Step 2. Assess the Risk

- Three Problems with Standard Matrix

- Subjectivity in the two dimensions of the matrix due to individual interpretation of Severity and Probability.

- Inconsistency because of subjectivity. Problem arises if the two hazards are competing for same risk control resource.

- Only four ranges with most falling in the medium and high risk level.
Step 2. Assess the Risk

**Modified Risk Matrix**

<table>
<thead>
<tr>
<th>Severity</th>
<th>Probability</th>
<th>Frequent</th>
<th>Likely</th>
<th>Occasional</th>
<th>Seldom</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catastrophic</td>
<td>I</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Critical</td>
<td>II</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Moderate</td>
<td>III</td>
<td>5</td>
<td>9</td>
<td>10</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Negligible</td>
<td>IV</td>
<td>13</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>

Risk Levels
Step 2. Assess the Risk

- Modified Risk Matrix
  - 20 levels of risk, using a top-down order of priority. Highest risk is number 1.
  - Helps to prioritize risk control efforts.
  - Can be used to group risks into clusters of related risks.
  - Does not replace the standard matrix but augments it.
Step 3. Analyze Risk Control Measures

• Analyzing Risk Control Measures involves three actions.
  
  ➢ Identify Control Options
  
  ➢ Determine Control Effects
  
  ➢ Prioritize Control Measures

• Important to keep risk at the best acceptable level using control options, even if risk seems to be at an acceptable level.
Step 3. Analyze Risk Control Measures

Identify Control Options

- Eight major risk control options are designed to have the broadest application:
  - Reject the Risk
  - Avoid the Risk
  - Delay the Risk
  - Transfer the Risk
  - Spread the Risk
  - Compensate for the Risk
  - Accept the Risk
  - Reduce the Risk
Step 3. Analyze Risk Control Measures

Identify Control Options

- **Reject the Risk** if overall risks exceed benefits. It is the correct option if you do not have the authority to put proper controls in place.

- **Avoid the Risk** by going around it or by performing the operation in another way.

- **Delay the Risk** is the right answer if there is no urgency to perform the operation. The hazard could go away or the operation may not be needed.
Step 3. Analyze Risk Control Measures

Identify Control Options

- **Transfer the Risk** to another individual or operation. The hazard is not eliminated but may be better controlled with a different operator and/or equipment.

- **Spread the Risk** by increasing the exposure distance or increase the time between exposure events.

- **Compensate for the Risk** by having redundant capabilities; extra resources or parts.

- **Accept the Risk** if benefits exceed the cost in personnel and resources. Use risk controls to reduce the risk to its lowest possible level.
Step 3. Analyze Risk Control Measures
Identify Control Options

• **Reduce the Risk** is the most widely used option. Brainstorm to come up with ideas or use the Risk Control Options Matrix.

  - Risk Control Options Matrix uses 46 proven ways to reduce risk from most preferred to least preferred control area.
## Step 3. Analyze Risk Control Measures

### Risk Control Options Matrix

<table>
<thead>
<tr>
<th>Options</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINEER/ENERGY MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>Limit Energy</td>
<td>• Reduce speeds, reduce heights</td>
</tr>
<tr>
<td>Substitute Safer Form</td>
<td>• Less hazardous chemicals</td>
</tr>
<tr>
<td>Prevent Buildup</td>
<td>• Automatic cutoffs, limit momentum</td>
</tr>
<tr>
<td>Prevent Release</td>
<td>• Containment, chock A/C &amp; vehicles</td>
</tr>
<tr>
<td>Provide Slow Release</td>
<td>• Use energy absorbing materials</td>
</tr>
<tr>
<td>Re-channel/Separate in Time/Space</td>
<td>• Barriers, launch A/C farther apart</td>
</tr>
<tr>
<td>Provide Special Maintenance of Controls</td>
<td>• Special procedures, checklists</td>
</tr>
<tr>
<td>GUARD</td>
<td></td>
</tr>
<tr>
<td>On Source</td>
<td>• Fire suppression, energy absorption</td>
</tr>
<tr>
<td>Barrier Between</td>
<td>• Walls, distance</td>
</tr>
<tr>
<td>On Human or Object</td>
<td>• Personal protective equipment</td>
</tr>
<tr>
<td>Raise Threshold (Harden)</td>
<td>• Reinforce, physical conditioning</td>
</tr>
</tbody>
</table>
### Step 3. Analyze Risk Control Measures

**Risk Control Options Matrix (Cont’d)**

<table>
<thead>
<tr>
<th>IMPROVE TASK DESIGN</th>
<th>LIMIT EXPOSURE</th>
<th>SELECTION OF PERSONNEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sequence of Events/Flow</td>
<td>• Number of People/Items</td>
<td>• Mental Criteria</td>
</tr>
<tr>
<td>• Timing (within/between tasks)</td>
<td>• Time</td>
<td>• Emotional Criteria</td>
</tr>
<tr>
<td>• Man-Machine Interface/ Ergonomics</td>
<td>• Interactions</td>
<td>• Physical Criteria</td>
</tr>
<tr>
<td>• Simplify Tasks</td>
<td></td>
<td>• Experience</td>
</tr>
<tr>
<td>• Reduce Tasks Loads</td>
<td></td>
<td>• Essential skills, proficiency, common sense</td>
</tr>
<tr>
<td>• Physical, Mental, Emotional</td>
<td></td>
<td>• Essential stability and maturity</td>
</tr>
<tr>
<td>• Backout Options</td>
<td></td>
<td>• Essential strength, endurance, motor skills</td>
</tr>
</tbody>
</table>

• Toughest task first, only a few in a row
  • Allow enough time, don’t rush
• Proper fitting equipment, good design
  • Provide job aids, safely reduce steps
• Set weight limits, use automation
  • Avoid excessive stress, provide breaks
• Stop process if new hazards observed
  • Only expose essential personnel & things
• Minimize time of exposure
  • Limit repeat exposures
### Advanced ORM

## Step 3. Analyze Risk Control Measures

### Risk Control Options Matrix (Cont’d)

<table>
<thead>
<tr>
<th>TRAIN AND EDUCATE</th>
<th>WARN</th>
<th>MOTIVATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Core Tasks (especially critical tasks)</td>
<td>• Signs/Color Coding</td>
<td>• Measurable Standards</td>
</tr>
<tr>
<td>• Leader Tasks</td>
<td>• Audio/Visual Alarms</td>
<td>• Essential Accountability</td>
</tr>
<tr>
<td>• Emergency Contingency Tasks</td>
<td>• Briefings</td>
<td>• Positive/Negative Incentives</td>
</tr>
<tr>
<td>• Safety Tasks</td>
<td></td>
<td>• Competition</td>
</tr>
<tr>
<td>• Rehearsals</td>
<td></td>
<td>• Demonstrations of Effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Define min acceptable risk controls</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Check performance at essential levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Meaningful awards or punishment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Healthy competition on a fair basis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Graphic, dynamic, tasteful demos of effects of unsafe acts</td>
</tr>
</tbody>
</table>

- Define min abilities: train, test, score
- Define leader standards: train, test, score
- Define, assign, train, verify ability
- Hazard ID, risk controls, standards
- Validate process, skills, verify interfaces
- Warning, instruction and traffic signs
- Bells, flares, flashing lights, whistles
- Refresher training, demonstrate hazards
- Define min acceptable risk controls
- Check performance at essential levels
- Meaningful awards or punishment
- Healthy competition on a fair basis
- Graphic, dynamic, tasteful demos of effects of unsafe acts
### Step 3. Analyze Risk Control Measures

**Risk Control Options Matrix (Cont’d)**

<table>
<thead>
<tr>
<th>REDUCE EFFECTS</th>
<th>REHABILITATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• EMERGENCY Equipment</td>
<td>• Personnel</td>
</tr>
<tr>
<td>• Rescue Capabilities</td>
<td>• Facilities/Equipment</td>
</tr>
<tr>
<td>• Emergency Medical Care</td>
<td>• Mission Capabilities</td>
</tr>
<tr>
<td>• Emergency Damage Control Procedures</td>
<td></td>
</tr>
<tr>
<td>• Backup/Redundant Capabilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Rehabilitate to restore confidence</td>
</tr>
<tr>
<td></td>
<td>• Return key elements back to service</td>
</tr>
<tr>
<td></td>
<td>• Focus on restoration of mission</td>
</tr>
<tr>
<td>• Fire Extinguishers, first aid materials</td>
<td></td>
</tr>
<tr>
<td>• Rescue squad, equipment, 911</td>
<td></td>
</tr>
<tr>
<td>• Quality first aid personnel and facilities</td>
<td></td>
</tr>
<tr>
<td>• Emergency responses, co-agencies</td>
<td></td>
</tr>
<tr>
<td>• Alternate ways to perform mission</td>
<td></td>
</tr>
</tbody>
</table>
Step 3. Analyze Risk Control Measures

- **Determine Control Effects.** From the control matrix, determine what effect each option will have on the associated hazard.

- **Prioritize Risk Controls.** Controls must be chosen and prioritized that make the most effective and efficient use of mission available resources. Establish guidelines that will direct which control measure to recommend and implement.
Step 3. Analyze Risk Control Measures

• Guidelines for selecting risk control measures

  ➢ Follow all published directives.

  ➢ Select combinations yielding the most mission-supportive risk level; not necessary the lowest risk as there is a risk of mission ineffectiveness with not taking risks.

  ➢ Avoid incompatible risk controls. Do not have only Gatorade available to combat dehydration if persons are allergic to food additives; have water available also.

  ➢ Choose risk controls that reinforce each other. Discipline safety rule violators and have a special awards program for following safety procedures and being accident free.
Step 3. Analyze Risk Control Measures

• Guidelines for selecting risk control measures
  
  ➢ Evaluate full costs versus full benefits, not isolated areas. Apply controls to activities and personnel actually at risk.

  ➢ Choose redundant risk controls when it is mission supportive, practical and cost effective, but do not waste resources. The goal is optimum risk control.
Step 4. Make Control Decisions

Develop a decision making process and system that establishes who will select the risk controls to implement and who determines the final go/no-go decision.

**EXAMPLE** of Risk Decision Making Personnel for SAREX

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Decision Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-03, Extremely High</td>
<td>Wing Commander</td>
</tr>
<tr>
<td>04-08, High</td>
<td>Incident Commander</td>
</tr>
<tr>
<td>09-13, Medium</td>
<td>Mission Safety Officer</td>
</tr>
<tr>
<td>14-20, Low</td>
<td>Operations/Planning Section Chief</td>
</tr>
</tbody>
</table>
Step 4. Make Control Decisions

• The decision maker
  - Must pick the controls.
  - Oversee their implementation.
  - Decide how much to spend.
  - Be responsible for the outcome of the operation.
  - Be able to obtain resources needed.
  - Be in control of the resources.
  - Have authority in the chain of command.

• Implement a good decision making process by using a decision matrix.
Step 4. Make Control Decisions

• Rank each risk control option considering on a scale of 1 to 10, 1 being the lowest and 10 the highest, on a list of chosen desirable characteristics. Add up each risk’s score. The option with the highest score is chosen.

• An example of decision matrix follows:
### Step 4. Make Control Decisions

#### Example of Decision Matrix

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Control Option:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Cost</td>
<td></td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Easy to Implement</td>
<td></td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td>9</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Positive Operator Involvement</td>
<td></td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Consistent with Culture</td>
<td></td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Easy to Integrate</td>
<td></td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>10</td>
<td>5</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Easy to Measure</td>
<td></td>
<td>8</td>
<td>4</td>
<td>9</td>
<td>5</td>
<td>8</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Low Risk/Sure to Succeed</td>
<td></td>
<td>8</td>
<td>10</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td></td>
<td>42</td>
<td>47</td>
<td>42</td>
<td><strong>60</strong></td>
<td>48</td>
<td>45</td>
<td>55</td>
</tr>
</tbody>
</table>
Step 5. Implement Risk Controls

• Once the risk control decision is made, assets must be made available to implement specific controls.

• To implement risk controls
  - Develop a complete action plan
  - Establish accountability
  - Provide a means of resource support
Step 5. Implement Risk Controls

• Develop an action plan to manage the control options:
  ➢ Determine all manpower and resources needed.
  ➢ Estimate cost to implement each control.
  ➢ Set a timeline that clearly sets milestones and goals.
  ➢ Assign tasks and due-dates to specific personnel.
  ➢ Enlist user input to establishment ownership.
  ➢ Provide job aids, tools and examples to make implementation clear to everyone.
  ➢ Measure performance.
  ➢ Document any outside support given.
Step 5. Implement Risk Controls

• Establish levels of accountability:

  ➢ Identify person responsible for successful implementation of each control measure.

  ➢ Identify unit or operations level person responsible for the implementation as a whole.

  ➢ Combine the power of command with leadership to maintain accountability.

  ➢ Establish motivation and create meaningful and positive incentives for success.

  ➢ Involve persons affected by the controls during implementation.
Step 5. Implement Risk Controls

• Resource support includes six components:
  
  ➢ Policy support with operating instructions, technical orders, and any standard operating procedures.
  
  ➢ Command support showing the absolute backing of the leadership.
  
  ➢ Training support for personnel implementing controls.
  
  ➢ Tools support including job aids, checklists, decision guides and instructions.
  
  ➢ Measurement support to determine if timelines, schedules and standards are being met.
  
  ➢ Motivation support providing the positive and negative incentives for a successful risk control.
Step 6. Supervise and Review

- Determining the effectiveness of risk control involves setting a goal, knowing where you are in relation to the goal, and a plan in place to reach the goal.

- This last step of ORM involves
  - Supervise
  - Review
  - Feedback
Step 6. Supervise and Review

• **Supervise** the implementation plan, insure all are in place, monitor all controls, and make certain they are effective.

• Controls are effective if they bring about favorable changes to the physical condition or personal behavior.

• If control is ineffective, correct or discontinue.

• Can use the Change Analysis Tool from Step 1 to reevaluate any changes that require further risk management.
Step 6. Supervise and Review

• **Review** the total cost versus total benefits the controls provide; for each control consider both physical and behavioral changes.

  ➢ Costs should be in line with expectations. The benefits in risk reduction should be greater than the cost of the control measure.

  ➢ Benefits or effectiveness of controls should be compared to forecasted goals.

  ➢ A simple cost vs. benefit matrix is recommended.
Step 6. Supervise and Review

- **Feedback** is the essential element in Step 6. It provides the ability to share success and failure. One of the basic rules of ORM is to stop reinventing the wheel and learn from past practices and from the mistakes of others.

- Feedback should go to all personnel; from new cadets to commanders. Effective risk controls that increase the overall mission success should be a part of every CAP member’s lessons learned file.
Conclusion

• To fully realize all the benefits from ORM, it must be integrated into every aspect of CAP’s organization and its missions.

• All levels of CAP should proactively promote and use ORM.

• It’s use will benefit everyone by improving mission capability, enhancing better decision making, reducing accidents and injuries, preserving our assets.
Advanced ORM

References

- Air Force Instruction 90-901, *Operational Risk Management*
- Air Force Pamphlet 90-902, *Operational Risk Management (ORM) Guidelines and Tools*
Civil Air Patrol wishes to thank the USAF Safety Center for the use of their information in the creation of this presentation.
To complete the Advanced ORM Test, 
[Click Here](#).