

# MISSION AIRCREW ORM REVIEW



# Objectives

- ▣ - ORM Review
- ▣ - When to use ORM
- ▣ - Online ORM form usage
- ▣ - Common mistakes
- ▣ - Icing, The regs and You

# Basic ORM

- ▣ The Six Steps of the ORM Process
  1. Identify the hazards
  2. Assess the risks
  3. Analyze the risk control measures
  4. Make control decisions
  5. Risk control implementation
  6. Supervise and review

# Basic ORM

## 1. Identify the hazards:

This is the foundation of the ORM process.

If you don't know the hazards to mission degradation, personnel injury or death, or property damage, then they can't be controlled.

A hazard is simply a condition that could cause loss. Focus on what is at risk and list potential hazards.

# Basic ORM

## 2. Assess the risks:

Quantify and qualify the probability and severity of loss from exposure to the hazard.

Examine each hazard and determine the exposure, severity and mishap probability for the activity. After a hazard is examined, risk can be established. Use the Risk Assessment Index, to prioritize the hazards into levels of risk and work on the worst one first. Managers should deal in risk rather than hazards since hazards do not have an explicit mission connection.

# Basic ORM

## 3. Analyze risk control measures:

Investigate a variety of actions which will either reduce or eliminate the risk.

Determine which risks can be eliminated, reduced or controlled in some manner. If you did the previous step correctly, you'll know which one to concentrate on first. A risk control must change the risk by impacting the exposure, severity or the probability of a mishap. Prioritize these control measures to get the most "bang for your buck".

# Basic ORM

## 4. Make control decisions:

The appropriate decision maker uses cost versus benefit analysis to choose the best control(s).

This step involves two actions. First, select the best possible risk controls. Next, decide if those controls will assure that the benefits will outweigh the costs.

This decision making process should involve the right person making the decision at the right time, based on the right inputs.

# Basic ORM

## 5. Risk control implementation:

The key here is for the risk controls to truly be integrated within the plans, processes and operations with which they are associated.

Without integration, it won't be nearly as effective. For the controls to be successful, the implementation must be clear to everyone, there must be accountability and leadership must provide support.

# Basic ORM

## 6. Supervise and review:

When risk controls are properly integrated, the supervision of them is just like any other leadership action -- this is the prime reason for the emphasis on completely integrating the risk controls.

Review is the systematic measurement of whether or not the benefit was worth the cost. This is the management aspect of ORM.

# Basic ORM

- ▣ One of the objectives of risk management training is to develop sufficient proficiency in applying the process so that risk management becomes an automatic part of the decision-making methodology during CAP activities and your personal time.

# Basic ORM

## LEVELS OF SEVERITY

- ▣ **Catastrophic** – Complete mission failure, death, or loss of system.
- ▣ **Critical** – Major mission degradation, severe injury, occupational illness or major system damage.
- ▣ **Moderate** – Minor mission degradation, injury, minor occupational illness, or minor system damage.
- ▣ **Negligible** – Less than minor mission degradation, injury, occupational illness, or minor system damage.

# Basic ORM

## LEVELS OF PROBABILITY

- ▣ **Frequent** (Individual/Item) – Occurs often in career/equipment service life. Everyone exposed. Continuously experienced.
- ▣ **Likely** (Individual/Item) – Occurs several times in career/equipment service life. All members exposed. Occurs frequently.
- ▣ **Occasional** (Individual/Item) – Occurs sometime in career/equipment service life. All members exposed. Occurs sporadically, or several times in inventory/service life.

# Basic ORM

## LEVELS OF PROBABILITY

- ▣ **Seldom** (Individual/Item) – Possible to occur in career/equipment service life. All members exposed. Remote chance of occurrence; expected to occur sometime in inventory service life.
- ▣ **Unlikely** (Individual/Item) – Can assume will not occur in career/equipment service life. All members exposed. Possible, but improbable; occurs only very rarely.

# Basic ORM

## Risk Assessment Matrix

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
S E V E R I T y	Catastrophic	Extremely High				
	Critical		High			
	Moderate		Medium			
	Negligible		Low			

# Civil Air Patrol

- ▣ Now that we remember what ORM is all about, why isn't the online form working?



# Basic ORM

- Many of our aircrews are treating the ORM form as another set of boxes that need to be checked before they can get on with their mission.
- There is no real risk analysis being done.
- Crews don't really read or understand each topic.
- Compliancy causes us to fill in the same numbers every time, not reflecting actual risks of that particular mission.

# Basic ORM

- Our wing requires the online ORM form for every mission flight.
- Ideally, getting in the habit of filling out the ORM for every flight will reduce risk in our flight operations.
- Use the ORM form to ACTUALLY consider risk and potential methods to minimize it.

# WMIRS ONLINE ORM Form

Factor	Low	Moderate	High	No Go
<b>Human</b>				
Pilot Experience	<input checked="" type="radio"/> > 1,000 hours PIC (0.0 pts.)	<input checked="" type="radio"/> > 250 < 1,000 hours PIC (1.0 pts.)	<input checked="" type="radio"/> < 250 hours PIC (2.0 pts.)	
CAP Flying Experience	<input checked="" type="radio"/> > 50 hours mission time (0.0 pts.)	<input checked="" type="radio"/> > 25 hours < 50 hours mission time (1.0 pts.)	<input checked="" type="radio"/> < 25 hours mission time (2.0 pts.)	
Pilot Currency (90 Days)	<input checked="" type="radio"/> > 10 hours (0.0 pts.)	<input checked="" type="radio"/> > 5 hours < 10 hours (1.0 pts.)	<input checked="" type="radio"/> < 5 hours (2.0 pts.)	
Pilot Duty Day	<input checked="" type="radio"/> < 8 hrs (0.0 pts.)	<input checked="" type="radio"/> 8-10 hours (1.0 pts.)	<input checked="" type="radio"/> > 10 hours (2.0 pts.)	
Crew Rest	<input checked="" type="radio"/> Good Health and Fully Rested (0.0 pts.)	<input checked="" type="radio"/> Fair Health and / or some signs of fatigue (1.0 pts.)	<input checked="" type="radio"/> Fatigued (40.0 pts.)	
<b>Mission</b>				
Solo or Crewed	<input checked="" type="radio"/> Crewed (0.0 pts.)	<input checked="" type="radio"/> Solo (1.0 pts.)	<input checked="" type="radio"/> N/A (0.0 pts.)	
Sorties in a day	<input checked="" type="radio"/> One (0.0 pts.)	<input checked="" type="radio"/> Two (1.0 pts.)	<input checked="" type="radio"/> Three or more (2.0 pts.)	
Cumulative Sortie(s) Length	<input checked="" type="radio"/> < 2.5 hours (0.0 pts.)	<input checked="" type="radio"/> 2.5 - 4.0 hours (1.0 pts.)	<input checked="" type="radio"/> > 4.0 hours (2.0 pts.)	
Mission complexity	<input checked="" type="radio"/> Routine (0.0 pts.)	<input checked="" type="radio"/> Complex (1.0 pts.)	<input checked="" type="radio"/> Training (2.0 pts.)	
Overwater Flight	<input checked="" type="radio"/> Not overwater (0.0 pts.)	<input checked="" type="radio"/> No portion of flight beyond (1.0 pts.)	<input checked="" type="radio"/> Some portion beyond gliding distance to land (2.0 pts.)	
(if overwater) Immersion suit	<input checked="" type="radio"/> N/A (0.0 pts.)	<input checked="" type="radio"/> With immersion suit (1.0 pts.)	<input checked="" type="radio"/> Without immersion suit (40.0 pts.)	
Mountain Flying Winds Aloft -9/12K	<input checked="" type="radio"/> < 15 Knots (0.0 pts.)	<input checked="" type="radio"/> 15-25 Knots (1.0 pts.)	<input checked="" type="radio"/> > 25 Knots (2.0 pts.)	
<b>Environment</b>				
Time of Day	<input checked="" type="radio"/> Day (0.0 pts.)	<input checked="" type="radio"/> Dawn/Dusk (1.0 pts.)	<input checked="" type="radio"/> Night (2.0 pts.)	
T-Storms Enroute	<input checked="" type="radio"/> None (0.0 pts.)	<input checked="" type="radio"/> Isolated (1.0 pts.)	<input checked="" type="radio"/> Few or Greater (2.0 pts.)	
Turbulence	<input checked="" type="radio"/> < Light (0.0 pts.)	<input checked="" type="radio"/> Forecast or reported moderate (ex. AIRMET Tango) (1.0 pts.)	<input checked="" type="radio"/> Forecast Severe (40.0 pts.)	
ITS <a href="#">View Chart</a>	<input checked="" type="radio"/> Normal (0.0 pts.)	<input checked="" type="radio"/> Caution (1.0 pts.)	<input checked="" type="radio"/> Danger (2.0 pts.)	<input checked="" type="radio"/> Cancel (No Go)
Wind Chill * <a href="#">View Chart</a>	<input checked="" type="radio"/> Normal (0.0 pts.)	<input checked="" type="radio"/> Caution (1.0 pts.)	<input checked="" type="radio"/> Danger (2.0 pts.)	<input checked="" type="radio"/> Cancel (No Go)
Icing / Freezing Level	<input checked="" type="radio"/> None reported (0.0 pts.)	<input checked="" type="radio"/> Forecast icing within 2000' of highest flight planned altitude (1.0 pts.)	<input checked="" type="radio"/> Forecast/reported icing at or below highest flight altitude (40.0 pts.)	
VFR Flight ceiling/visibility	<input checked="" type="radio"/> >3,000 AGL And >5 SM (0.0 pts.)	<input checked="" type="radio"/> >1,000 AGL < 3,000 AGL And/or > 3 < 5 SM (1.0 pts.)	<input checked="" type="radio"/> <1,000 AGL and/or <3 SM visibility (40.0 pts.)	
IFR Flight ceiling/visibility	<input checked="" type="radio"/> >500 AGL and/or 1-3 SM visibility (0.0 pts.)	<input checked="" type="radio"/> < 500 AGL and/or < 1 SM visibility (1.0 pts.)	<input checked="" type="radio"/> Below departure airport approach minimums (40.0 pts.)	
Surface crosswind component	<input checked="" type="radio"/> < 5 knots (0.0 pts.)	<input checked="" type="radio"/> 5-10 knots (1.0 pts.)	<input checked="" type="radio"/> > 10 knots (2.0 pts.)	
Airfield	<input checked="" type="radio"/> Familiar and > 3,000 ft runway (0.0 pts.)	<input checked="" type="radio"/> Unfamiliar and/or Take Off Distance (TOD) > 1/2 Runway Length (1.0 pts.)	<input checked="" type="radio"/> Unfamiliar and/or Take Off Distance (TOD) > 2/3 Runway Length (2.0 pts.)	

Submit

# ORM Form Issues!

Factor	Low	Moderate	High	No Go
Human				
Pilot Experience	 > 1,000 hours PIC (0.0 pts.)	 > 250 < 1,000 hours PIC (1.0 pts.)	 < 250 hours PIC (2.0 pts.)	
CAP Flying Experience	 > 50 hours mission time (0.0 pts.)	 > 25 hours < 50 hours mission time (1.0 pts.)	 < 25 hours mission time (2.0 pts.)	
Pilot Currency (90 Days)	 > 10 hours (0.0 pts.)	 > 5 hours < 10 hours (1.0 pts.)	 < 5 hours (2.0 pts.)	
Pilot Duty Day	 < 8 hrs (0.0 pts.)	 8-10 hours (1.0 pts.)	 > 10 hours (2.0 pts.)	
Crew Rest	 Good Health and Fully Rested (0.0 pts.)	 Fair Health and / or some signs of fatigue (1.0 pts.)	 Fatigued (4.0 pts.)	
Mission				

- Pilot Experience is pretty straight forward and no issues
- Cap Flying: Looking at our pilot flight time annual totals, many of us are over reaching in this field!
- Pilot Currency: appears to be another area many of us over estimate. US averages per pilot are about 35 hours per year... are you really 10 hours in the last 90 days???
- Duty Day: this isn't flight time, it's from the time you start CAP activities until you finish...
- Rest- after a long work week, not one pilot is a little tired, REALLY???

# WMIRS ONLINE ORM Form Problems

Solo or Crewed	<input checked="" type="radio"/> Crewed (0.0 pts.)	<input checked="" type="radio"/> Solo (1.0 pts.)	<input checked="" type="radio"/> N/A (0.0 pts.)
Sorties in a day	<input checked="" type="radio"/> One (0.0 pts.)	<input checked="" type="radio"/> Two (1.0 pts.)	<input checked="" type="radio"/> Three or more (2.0 pts.)
Cumulative Sortie(s) Length	<input checked="" type="radio"/> < 2.5 hours (0.0 pts.)	<input checked="" type="radio"/> 2.5 - 4.0 hours (1.0 pts.)	<input checked="" type="radio"/> > 4.0 hours (2.0 pts.)
Mission complexity	<input checked="" type="radio"/> Routine (0.0 pts.)	<input checked="" type="radio"/> Complex (1.0 pts.)	<input checked="" type="radio"/> Training (2.0 pts.)
Overwater Flight	<input checked="" type="radio"/> Not overwater (0.0 pts.)	<input checked="" type="radio"/> No portion of flight beyond (1.0 pts.)	<input checked="" type="radio"/> Some portion beyond gliding distance to land (2.0 pts.)
(if overwater) Immersion suit	<input checked="" type="radio"/> N/A (0.0 pts.)	<input checked="" type="radio"/> With immersion suit (1.0 pts.)	<input checked="" type="radio"/> Without immersion suit (4.0 pts.)
Mountain Flying Winds Aloft -9/12K	<input checked="" type="radio"/> < 15 Knots (0.0 pts.)	<input checked="" type="radio"/> 15-25 Knots (1.0 pts.)	<input checked="" type="radio"/> > 25 Knots (2.0 pts.)

Solo or Crewed: No errors here

Sorties in a day: This is your planned day. Most mission flying is three or more.

Sortie Length: Again this is your Planned day of flying. Frequent problems found during our audit!

Mission Complexity: What is written in the red box? Training! Most of our missions are some sort of Training!

Overwater flight: Our last mission had planes crossing lake Winnebago and taking photos of the Lake Michigan shore line, guess what box they checked?

# WMIRS ONLINE ORM Form Problems

Solo or Crewed	<input checked="" type="radio"/> Crewed (0.0 pts.)	<input checked="" type="radio"/> Solo (1.0 pts.)	<input checked="" type="radio"/> N/A (0.0 pts.)
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Immersion suits and mountain flying don't generally apply to our Wisconsin wing flying

# WMIRS ONLINE ORM Form Problems

Environment			
Time of Day	<input checked="" type="radio"/> Day (0.0 pts.)	<input type="radio"/> Dawn/Dusk (1.0 pts.)	<input type="radio"/> Night (2.0 pts.)
T-Storms Enroute	<input checked="" type="radio"/> None (0.0 pts.)	<input type="radio"/> Isolated (1.0 pts.)	<input type="radio"/> Few or Greater (2.0 pts.)
Turbulence	<input type="radio"/> < Light (0.0 pts.)	<input type="radio"/> Forecast or reported moderate (ex. AIRMET Tango) (1.0 pts.)	<input type="radio"/> Forecast Severe (40.0 pts.)
ITS <a href="#">View Chart</a>	<input checked="" type="radio"/> Normal (0.0 pts.)	<input type="radio"/> Caution (1.0 pts.)	<input type="radio"/> Danger (2.0 pts.)
Wind Chill * <a href="#">View Chart</a>	<input checked="" type="radio"/> Normal (0.0 pts.)	<input type="radio"/> Caution (1.0 pts.)	<input type="radio"/> Danger (2.0 pts.)
Icing / Freezing Level	<input checked="" type="radio"/> None reported (0.0 pts.)	<input type="radio"/> Forecast icing within 2000' of highest flight planned altitude (1.0 pts.)	<input type="radio"/> Forecast/reported icing at or below highest flight altitude (40.0 pts.)
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IFR Flight ceiling/visibility	<input checked="" type="radio"/> >500 AGL and/or 1-3 SM visibility (0.0 pts.)	<input type="radio"/> < 500 AGL and/or < 1 SM visibility (1.0 pts.)	<input type="radio"/> Below departure airport approach minimums (40.0 pts.)
Surface crosswind component	<input type="radio"/> < 5 knots (0.0 pts.)	<input type="radio"/> 5-10 knots (1.0 pts.)	<input type="radio"/> > 10 knots (2.0 pts.)
Airfield	<input checked="" type="radio"/> Familiar and > 3,000 ft runway (0.0 pts.)	<input type="radio"/> Unfamiliar and/or Take Off Distance (TOD) > 1/2 Runway Length (1.0 pts.)	<input type="radio"/> Unfamiliar and/or Take Off Distance (TOD) > 2/3 Runway Length (2.0 pts.)

Time of Day: If your sorties will transition time periods, pick the most risky selection.

T-Storms enroute: We do a good job with this area

Turbulence: Did you look at Airmets?

ITS: Have you looked at this chart?

Wind Chill: Did you use the chart and do you have proper clothing for the weather?

Icing: At our last mission we had MVFR ceilings with PIREP's of ice in the layer just above. Most of our pilots checked no for icing. The yellow area would have been a better choice.

# WMIRS ONLINE ORM Form Problems

Environment			
Time of Day	<input checked="" type="radio"/> Day (0.0 pts.)	<input type="radio"/> Dawn/Dusk (1.0 pts.)	<input type="radio"/> Night (2.0 pts.)
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Surface crosswind component	<input type="radio"/> < 5 knots (0.0 pts.)	<input type="radio"/> 5-10 knots (1.0 pts.)	<input type="radio"/> > 10 knots (2.0 pts.)
Airfield	<input checked="" type="radio"/> Familiar and > 3,000 ft runway (0.0 pts.)	<input type="radio"/> Unfamiliar and/or Take Off Distance (TOD) > 1/2 Runway Length (1.0 pts.)	<input type="radio"/> Unfamiliar and/or Take Off Distance (TOD) > 2/3 Runway Length (2.0 pts.)

VFR and IFR Ceiling and visibility: We are doing a pretty good job with these fields, please keep in mind the worst weather forecast during the mission should be used in these boxes.

Crosswinds: Again, we are doing a good job here as well. This box should be for the worst forecast Crosswinds during the mission.

Airfield: Familiar doesn't mean an airfield that you have ever been to. A good guide here is if you know the frequencies for weather and communications without looking them up, that's a familiar field. Did you calculate T/O Distance???

# ORM Score

- ▣ We need to look at the ORM score in a new light.
- ▣ Pilots strive to reduce the scores as low as possible, thinking that is reducing the risk.
- ▣ Our new way of thinking needs to be to go back to the ORM philosophy and identify each risk and then plan how to minimize each threat!

# Remember These?

- ▣ The Six Steps of the ORM Process
  1. Identify the hazards
  2. Assess the risks
  3. Analyze the risk control measures
  4. Make control decisions
  5. Risk control implementation
  6. Supervise and review

# A word on icing

- ▣ What are the rules when flying part 91 for CAP?
- ▣ It's complicated...
- ▣ Many of us believe that we can't fly into "known icing"
- ▣ Which regulation says this?
- ▣ Is an Airmet Known icing, or do there have to be pilot reports?

# A word on icing, the rules

- ▣ 91.9(a) and 91.13 apply
- ▣ 91.9(a) says: Except as provided in paragraph (d) of this section, no person may operate a civil aircraft without complying with the operating limitations specified in the approved Airplane or Rotorcraft Flight Manual, markings, and placards, or as otherwise prescribed by the certificating authority of the country of registry.

# A word on icing, the rules

- ▣ 91.9(a) = follow the POH
- ▣ What does the POH say?
- ▣ A 1979 Cessna 172N says in the limitation section “flight into known icing is prohibited”
- ▣ The NTSB has ruled that pilot reports of no ice, but a forecast of potential ice is a violation.

# A word on icing, NTSB findings

- ▣ For years following the Bowen decision, Part 91 pilots labored under the misapprehension that it was "legal" to fly in areas where icing was merely a forecast event if they had received actual pilot reports reflecting the absence of ice. That misconception was shattered in 1993 when the Board issued its decision in the Groszer case.

# A word on icing, NTSB findings

- ▣ The Groszer case: The pilot was found to have operated his aircraft in contravention of its operating limitations and in a careless or reckless manner and, based on those findings, his private pilot certificate was suspended for 180 days.

# A word on icing, NTSB findings

- ▣ Careless and reckless you say?
- ▣ 91.13 says: No person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another.
- ▣ 91.13 impose upon you the obligation of exercising good judgment as pilot in command to assure that forecast and known icing conditions will not endanger the life or property of another.

# A word on icing, The rules

## ▣ What about 91.527?

- ▣ §91.527 **Operating in icing conditions.**
- ▣ (a) No pilot may take off an airplane that has frost, ice, or snow adhering to any propeller, windshield, stabilizing or control surface; to a powerplant installation; or to an airspeed, altimeter, rate of climb, or flight attitude instrument system or wing, except that takeoffs may be made with frost under the wing in the area of the fuel tanks if authorized by the FAA.
- ▣ (b) No pilot may fly under IFR into known or forecast light or moderate icing conditions, or under VFR into known light or moderate icing conditions, unless —
  - ▣ (1) The aircraft has functioning deicing or anti-icing equipment protecting each rotor blade, propeller, windshield, wing, stabilizing or control surface, and each airspeed, altimeter, rate of climb, or flight attitude instrument system;
  - ▣ (2) The airplane has ice protection provisions that meet section 34 of Special Federal Aviation Regulation No. 23; or
  - ▣ (3) The airplane meets transport category airplane type certification provisions, including the requirements for certification for flight in icing conditions.
- ▣ (c) Except for an airplane that has ice protection provisions that meet the requirements in section 34 of Special Federal Aviation Regulation No. 23, or those for transport category airplane type certification, no pilot may fly an airplane into known or forecast severe icing conditions.
- ▣ (d) If current weather reports and briefing information relied upon by the pilot in command indicate that the forecast icing conditions that would otherwise prohibit the flight will not be encountered during the flight because of changed weather conditions since the forecast, the restrictions in paragraphs (b) and (c) of this section based on forecast conditions do not apply.

# A word on icing, The Rules

- ▣ 91.527 is for Large and turbine airplanes you say?
- ▣ (from 91.527)(b) No pilot may fly under IFR into known or forecast light or moderate icing conditions, or under VFR into known light or moderate icing conditions
- ▣ Think about that for a second, if part 91 says we can't fly large or turbine planes into forecast ice, can you justify to the NTSB why you can fly your smaller and less powerful 182 into forecast ice?

# Summary

- ▣ CAP expects us to operate as a professional aircrew following good safety practices.
- ▣ We need to “up our game” in flight risk management
- ▣ Our attitude when flying CAP aircraft needs to shift from private pilot rules to professional flight crews norms

# Summary

- ▣ In flying I have learned that carelessness and overconfidence are usually far more dangerous than deliberately accepted risks.
- ▣ – *Wilbur Wright in a letter to his father, September 1900*