



Aviation Emergency Response Exercises

1. Introduction

This document provides guidance to aviation departments / operators on how to conduct emergency response exercises. They are intended to be scalable and modified for any size department or complexity of operation.

AeronomX offers this document at no cost, available for download on our website along with other free aviation safety and operational tools. AeronomX offers consulting and auditing services, including assistance in conducting an Integrated Emergency Response Exercise. Please contact us or visit our website for more information:

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2. Recommendations for Operators

It is an industry best practice, and an IS-BAO requirement, for operators to have an Emergency Response Plan (ERP) that addresses both flight and non-flight related emergencies.

An ERP should be periodically reviewed, either internally or as part of a coordinated effort with other operational or emergency support providers. All aspects of an ERP should be tested every three years, rotating from year to year with different drills and exercises. Drills and Tabletop Exercises are best run annually, while Integrated Exercises should be held every three years or when implementing a new system. (See chart in section 3. Types of Exercises for details.) Aim for every person who is part of the emergency response plan to participate in at least one drill or exercise every two years.

Testing the ERP through drills and exercises helps ensure the emergency response plan capability is adequate, addresses any operational change, and identifies areas of improvement. It is important that emergency response plans are updated for any lessons learned through exercises. Review and analyze your response in the event of an actual emergency to identify opportunities for improvement and track your progress on necessary changes. Documentation of the emergency response exercises and the resulting findings process is valuable when undergoing an audit.

AeronomX is available to provide assistance and oversight in conducting emergency response exercises.

3. Types of Exercises

There are a number of different types of exercises that you may use depending on the objectives you are setting out to achieve. The following table describes the general characteristics of each.

	Drill	Tabletop Exercise	Integrated Exercise
Scope of Scenario	Limited, focused on a single procedure.	Broader in scope, focuses on roles, policy, and strategy.	Very broad in scope, includes others outside the flight department.
Examples	Facility fire evacuation or call chain test.	Verbally role-play in real or accelerated time using scenarios such as: missing aircraft, notification of aircraft accident, or serious injury within the hangar.	Test the integrated response to a simulated large-scale emergency involving several outside organizations for scenarios such as: aircraft accidents, loss of life, or complex real-world situations.
Participants	Those present at the facility at the time.	ERP managers, exercise coordinators, some focused department personnel.	The entire aviation department, corporate management, frequent passengers, and other outside agencies.
Facilitation	Simple, can be an open process.	Involved, requiring role designation with advance preparation for the exercise. Coaching used to keep scenario on-track and lead discussions.	Complex, best handled by a professional outside the department. (AeronomX provides this service.) Reports identify process and policy deficiencies for analysis and risk mitigation.

4. Roles of Exercise Participants

There are four different roles for those who take part in an exercise: Facilitator, Responder(s), Operator, and Observer. It will need to be decided what degree of involvement is appropriate. In some cases it may be necessary to combine these roles for a single individual, but this should be kept to a minimum to ensure full and realistic participation.

Facilitator

Typically a role held by the Emergency Response Manager / Coordinator or the Safety Officer / Manager of the department. The Facilitator:

- Conducts the exercise and does not participate in the exercise.
- Leads in all preparation efforts for the exercise.
- Provides / reveals exercise-related information to Operators and Responders as needed.
- May prompt or initiate certain actions to ensure continuity as the exercise unfolds.
- Communicates regularly throughout the exercise to ensure coordination.

Note: If you need to combine the Facilitator role with an Operator or Responder role, you must ensure the workload associated with both roles can be balanced and the proprietary information received as a Facilitator does not inappropriately influence other roles.

Responder

The individual (or several individuals) assigned with management responsibilities within the ERP. This may be the Emergency Response Director, Chief Pilot, Director of Aviation, Director of Maintenance, or other manager positions. The lead Responder may vary depending on who is involved in each scenario. The Responder(s):

- Have overall responsibility for managing the emergency and its impact on the department and company.
- Activate your emergency response infrastructure (e.g. incident command process).
- Hold authority to mobilize resources.
- Engage those in the Operator role to participate in the exercise.
- Prepare information for a corporate media or public affairs spokesperson.
- Communicate with municipal and other government authorities.

Operator

Everyone within the aviation department that is taking part in the exercise but is not a Responder assumes the role of the Operator. Typically the Operator role is held by pilots, aircraft mechanics, and office staff. Communications are either in real-time regarding the emergency or accelerated in a tabletop exercise.

Observer

Observers do not participate in the exercise, but evaluate the effectiveness of those who are participating in the exercise by providing feedback to all roles. Observers are also responsible for making appropriate documentation of the exercise.

5. How to Plan and Conduct an Exercise

Preparing for an Exercise

All exercises require some degree of advance planning, and this effort can range from a few hours to several months depending on the scope of the exercise. The following outlines what is required to plan:

- Exercise date and geographic scope
- Exercise objectives
- Anticipated participants
- Participant requirements
- Cue cards that detail the scenario and prompt response
- Modify and add details to the scenarios as needed create an experience relevant and realistic to department operations

Conducting the Exercise

The Facilitator initiates the exercise and makes all decisions regarding the overall conduct of the integrated exercise, including cancellation. Given the substantial commitment of resources needed for a large-scale exercise, cancellation would only occur if conditions or circumstances affecting a significant number of participants were serious enough so as to threaten the viability of the exercise.

The Operator should adhere to established procedures, SOPs, and other formal policies. Responders should adhere to the ERP procedures as much as possible throughout the exercise. The intent is to test the ERP and find areas for improvement.

To start the exercise, once initiating conditions are met, the Facilitator delivers the first cue card to a participating member. Cue cards (developed in advance by the Facilitator) are used to prompt actions by participants and to play out the scenario. The Facilitator holds the cue cards and distributes them to the appropriate participants according to the master cue-card schedule. It is important these cue cards be distributed in a timely manner so that the scenario unfolds in a synchronized manner with all participants. The Facilitator should be alert and take the liberty to improvise with new or modified cue cards that deal with any unexpected responses by the Operator.

Participants are encouraged to play out their response as realistically as possible using the information, tools, and procedures they would normally use to respond to events. During the course of the exercise, participants should state aloud or write down their intended actions they would take in a real situation. If phone calls are required, they can be simulated but how / where the contact information is found and the information itself on file should be tested for accessibility and current validity.

The exercise ends when the Facilitator notifies the Responders it has concluded. In turn all Operator participants will be advised that the exercise is terminated.

Evaluating the Exercise

All participants are encouraged to provide feedback regarding lessons-learned and identified areas of improvement. The success of the exercise is assessed against the exercise objectives set by the Facilitator when the exercise was designed. All participants are expected to self-evaluate their performance.

Each participating company should develop their own evaluation report to record successes and findings. Detailed findings, such as those that affect the department operation, should be reviewed and addressed as part of the ERP.

The exercise evaluation report should include findings, recommendations to mitigate the findings, and a rank that identifies the findings according to the following categories:

- **Observation** – Finding has little direct impact on emergency response, but should be considered as an improvement to your emergency response processes.
- **Gap** – Finding had some measurable impact on timeliness or effectiveness of emergency response.
- **Significant Gap** – Finding had significant impact on timeliness or effectiveness of emergency response with significant potential to impact outcome of success.

Corrective Action Plan

Once the root cause has been determined for each finding, an action plan should be developed to address them. At a minimum, action plans should include:

- Circumstances leading up to the event.
- The event, failure, or violation of ERP policy that occurred.
- Impact on the reliability of the ERP.
- The root cause(s) that resulted in the finding.
- Actions you are taking to prevent or minimize a recurrence.
- A schedule for completing the action plan.

The action plan becomes part of the Safety Management System (SMS) processes and is expected to result in a revision to the ERP.

6. Tabletop Exercises

Tabletop Scenario #1: Runway Overrun

Your aircraft is returning to home base in the afternoon with your principal passenger and two other guests. One of the guests, who has never flown on the plane before but is known to the principal passenger, was a last minute addition when they arrived at the departure airport. Upon landing at your home airport, the aircraft experiences a failure of normal braking during the landing roll. The pilot attempts to use emergency braking. Nevertheless, the aircraft exits the runway at the end at a moderate rate of speed of 30 knots. The aircraft rolls for another 300 feet past the end of the runway.

Facilitator Actions

Situation	Action
Initiating the exercise.	Hand cue card to Operator person of your choice as to how the department is notified of the runway overrun, such as, the tower calls, someone sees it firsthand and runs in announce it, or the pilot calls from his cell phone.
When an inquiry is made of the status of passengers, crew, and aircraft.	Reply with cue card that states the principal passenger is unconscious by being knocked around from not wearing his seat belt, but has no external bleeding. One pilot banged his head and is dazed. The other pilot and other passengers appear to be OK but shaken-up. The right main gear has collapsed. If your airport has a control tower, presume they have called for Crash Fire Rescue (CFR). If your airport does not have a tower, it is uncertain if CFR has been called.
At some point in responding to the information given above.	Hand cue card to Operator on scene that states a reporter from the local media arrived on the scene with CFR response. The reporter's editor is calling the President of the company for information about the accident.
After CFR has finished with the immediate response.	Hand cue card to Responder that states an FAA Inspector is calling to instruct the operator to preserve the scene and that they will be there within an hour to begin their investigation.
At some point in responding.	Hand cue card to the flight department manager or chief pilot that the company President is on the phone inquiring as to what happened.
When FAA arrives.	Hand cue card to Responder that the FAA Inspector wants to question the pilots as part of their investigation and wants to take the aircraft's maintenance logbooks with him to his office to review them.

When FAA completes on-scene investigation.	Hand cue card to Responder that the FAA has requested that the aircraft be promptly removed from its location so that the runway can be reopened.
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Scenario Considerations:

- What is 300 feet past the end of your runways? Would the aircraft have come in contact with something or go into a ravine or other?
- If this accident occurred after the tower closed or late in the evening, how would you have likely become aware of the overrun?
- If the dazed pilot was the Director of Operations/Chief Pilot, how does this affect the engagement of the ERP?
- What actions did the pilots take at the scene?
- Are the pilots and employees at the airport ready to handle the media?
- How can you ensure the news about the incident reaches the home office before the reporters? How was the company President handled?
- Did the Operator have an emergency contact number for the pilots and all passengers? Is the emergency contact information available for the last minute passenger? How was it obtained?
- How can you ensure the pilots and passenger's families hear about the incident from the company before the media?
- How was the FAA Inspector handled? How did he interview the pilots?
- How did the Operator preserve the scene for the FAA Inspector to arrive?
- How did you handle the FAA Inspector's request to take the maintenance logbooks?
- How would the aircraft be moved? Was the insurance claims person contacted?

Tabletop Scenario #2: Major Accident Off-Airport

Your aircraft is departing with 4 passengers from one of your most remote airports (but still domestic) that you go to semi-regularly. During the initial climb out passing through 1,000 feet AGL, the aircraft encounters a flock of large birds seriously damaging both engines and are shutdown. The crew picks a field for an emergency 2-engine failure landing (or ditches in a body of water if in the area).

Facilitator Actions

Situation	Action
Initiating the exercise.	Hand cue card to the Operator person of your choice as to how the department is notified of the accident. This may be difficult to determine depending on remoteness of the location and time of day. The notice may come from ATC or emergency responders in the area calling the organization that is listed on the aircraft's registration certificate, your tail number. If it is registered to a bank or obscure LLC name, notification may be difficult. If not sure, for this exercise presume that your local Sheriff calls the main switchboard of your company.
After ERP management team has been notified and an inquiry is made to verify the accident and status of passengers, crew, and aircraft.	Hand cue card to the Responder that the local sheriff's office on-scene is stating there is major damage, aircraft fire, unknown serious injuries, and at least one fatality. The injured are being transported to the local hospital but may be transferred to the neighboring big city with more advanced trauma and burn care capabilities. None of the crew or passengers are answering their cell phones.
After notification is made to the company HQ, and emergency contacts of passengers and pilots.	Hand cue card to Responder that family members are demanding more information as to the status of their loved one, extent of injuries, and hospital contact information. The spouse of one pilot and spouse of one of the passengers have asked if there is any way to fly or get to the city where the accident occurred.
If an inquiry is made by the ERP team to the local hospital or to the local county coroner or morgue.	Hand cue card to Responder that the hospital is asking questions as to who you are. Per hospital policy, they will not divulge sensitive information to someone who is not a family member of the injured.
When proper communications is established with hospital and coroner.	Hand cue card to Responder that one pilot and two passengers are dead. The others have received serious life threatening injuries. They are being helicopter EMS transported to the neighboring big city trauma care hospital.
At some point responding to the information given above.	Hand cue card to Responder that the most senior company officer (not on the flight) is calling for information about the accident and what steps have been taken. He also mentioned that CNN and the local news channels near the scene and also those at home base are calling and on their way to the airport hangar office.

Shortly after the Responder has been told the media is enroute to the office.	Hand cue card to Operator of your choice that the media is calling from the security gate or knocking on the door. They want information and want to put them on camera.
After the FAA has been notified (either by the company or after some time has passed by the local on-scene sheriff).	Hand cue card to Responder that states an FAA Inspector is calling to instruct the operator to preserve the scene and that they will be at the scene in about 4 hours and another inspector will be at the hangar within an hour to begin their investigation.
When FAA arrives at hangar.	Hand cue card to Responder that the FAA Inspector wants to question everyone in the flight department and maintenance staff as well as take the aircraft's maintenance logbooks with him to his office to review them.
At some point during responding.	Hand cue card to Responder that the executive assistant has called and wants to know how this will affect the other aircraft in your fleet, one of which is away from home. They are communicating with the passengers in a panic.

Scenario Considerations

- What are the possible various ways that notification of the accident would reach the ERP team in a remote location?
- Would your flight following procedure have discovered the accident? If so, when?
- Do you have a current and correct passenger manifest? Do you have the emergency contact information for everyone onboard?
- How can you ensure the pilots and passenger's families hear about the incident from the company before the media?
- How were the spouses handled that want to go to the scene? How did information updates get to family members? Were any resources provided to them?
- How were the family members of the deceased notified? What follow-up actions were taken with them, if any?
- Was it possible to get information from the hospital and coroner's office? If so, how?
- Did you send anyone to the location of the accident, or some sort of "go" team? What, if anything, were you able to do on the scene?
- How was the senior company officer handled? What sort of information was provided to him? Did he or someone else with the company talk to the media? What was said?
- How was the media handled at the hangar? Did anyone make a statement there? If any flight department employees were intercepted in the parking lot by a media person, what would happen or be said?
- How was the FAA Inspector handled? How did he interview the pilots?
- What steps were taken with the flight department? Did the department "stand-down" and cease normal operations? How was the potential trauma among department personnel handled?
- How would all of your response be affected if the accident occurred at one of your international destinations?

Tabletop Scenario #3: Missing Crewmember

Your aircraft is on an extended mission abroad and using an augmented crew with 3 pilots. Their current location stop is in a third-world county that English is not the primary language and is known to be a rough place. After 2 days at this location, on the evening before continuing the trip with the next leg tomorrow morning, the pilots were enjoying a beer at a local tavern and chatting about their occupation with some locals (their English was passable) who took an extreme amount of interest. Checking out of the hotel the next morning, one of the pilots does not show up in the lobby by the appointed time. Calls to his cell phone go to voicemail. They call the pilot's room from the lobby phone - no answer. They go and knock on his room door - no answer. They decide they will go to the airport without him presuming that he will eventually call or show up. After one hour at the airport they have still not heard from the third pilot. They decide to call the Chief Pilot.

Facilitator Actions

Situation	Action
Initiating the exercise.	Hand cue card to the Chief Pilot that has the information from the phone call from the pilot on the scene explaining that the third pilot is missing and not answering his cell phone.
A few minutes after handing him the first cue card.	Hand cue card to the Chief Pilot that the crew calls again stating the passengers have arrived and they want to depart.
A few minutes after the last cue card.	Hand cue card to the Chief Pilot that a call comes from the lead passenger asking about the missing pilot. Though he seems concerned about the situation, he says they want to leave this rough place and insists on departing for their next destination.
(If at any time the ERP team attempts to contact the missing pilots spouse or family.)	Hand cue card to the Responder detailing the conversation they had (either in person or by phone, however the ERP team contacted them) with the spouse/family. They stated that they have not heard from their spouse. They are now very worried and concerned. They want to know what steps are being taken to find them and to be kept informed.
If there is an inquiry made by the ERP team to the hotel to look in the room.	Hand cue card to the Responder that states that hotel management has agreed to check the room. The pilot is not there. His luggage and clothes are still there. The bed looks like it was slept in.
If there is an inquiry made by the ERP team to the local police.	Hand cue card to the Responder that states the police took the information about the missing person and will begin a search around the hotel.
If there is an inquiry made by the ERP team to any of the local hospitals.	Attempts should have been made to actually find the hospital phone numbers in that city. Then hand cue card to the Responder that states that there is an unconscious person that was brought by ambulance that morning that fits the description of their missing pilot, but there is no identification with the person.

<p>If there is a reasonable plan to confirm whether or not the unconscious person is the pilot.</p>	<p>Hand a cue card to the Responder that there is a message from the hospital (or means taken to identify the person) that positively identifies the unconscious person as their missing pilot.</p>
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Scenario Considerations

- Would your pilots decide to depart the hotel without the third pilot? If so, what actions would have been taken in that case?
- How was the lead passengers insistence to depart handled? Did the flight depart as scheduled? If so, what actions would be taken in that case? If it did not depart, what actions were taken?
- How was the spouse/family handled? Were their concerns properly addressed?
- How did the ERP team contact the police and hospitals? If they called, how did they find the phone numbers? How did they talk to them if the police and hospital workers did not speak English?
- How would you determine if the unconscious person at the hospital was your missing pilot?
- If and when the unconscious person at the hospital is positively identified as your pilot, what actions were taken then? Did anyone representing the company go to the hospital? Were plans made to move the missing pilot out of that hospital to a better city or county with better care? If so, how was this decided and accomplished? Was the spouse/family consulting in doing so?
- What plans were made to accommodate the needs of the passengers on this trip?
- Does the ERP address this kind of scenario in policy or procedure?

7. Drills

Drill Scenario #1: Approaching a Squall Line

You have a trip scheduled to depart from your home base. The normal staff is at the hangar and the crew is preflighting the aircraft outside on the ramp. There is a squall line quickly approaching the airport. Someone says they heard on the radio that there is a tornado watch. The city's tornado sirens start to blare.

Facilitator Actions

Situation	Action
Initiating the exercise.	Hand cue card to Operator person of your choice that states the tornado sirens just started.
Personnel should actually proceed to a tornado shelter. If they do NOT...	After 5 minutes, hand cue card to senior person for the department that is in the shelter that the tornado hit the hangar and all personnel not in the tornado shelter are injured. Some seriously.
After the sirens stop.	Hand cue card to the senior person for the department on the premises that states the tornado hit the hangar and the hangar door blew out hitting the aircraft causing substantial damage. Fuel is seen leaking out of the aircraft from the damage.

Scenario Considerations

- Did everyone understand to evacuate to the tornado shelter when the sirens started?
- Did someone account for everyone that was in the hangar and office making it to the shelter?
- Is the shelter well marked and easy to locate?
- If personnel were injured, what actions were taken to respond?
- With the aircraft damage, was the airport CFR contacted for possible fuel spill?
- Was the insurance claims office ever contacted?

Drill Scenario #2: Fire Alarm in the Hangar

At a time during normal business hours, the fire alarm in the hangar starts alarming.

Facilitator Actions

Situation	Action
Initiating the exercise.	Either set off the fire alarm in test mode, or walk about the facility stating in a loud voice the fire alarm is going off and this is a drill.

Scenario Considerations

- Was there a prompt response by personnel to evacuate the facility?
- Did someone account for everyone that was in the hangar and office making out of the facility? Was there a way of knowing everyone who was in the facility?
- Was a rally point used?
- Did anyone call 911 for fire response?
- Were potentially hazardous or highly flammable materials properly stored in the facility?
- Should the fire result in extensive damage, would important documentation have been preserved (e.g. aircraft logbooks)?