

Safety management system

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

Lecture Presented By: Kevin Kochersberger

In this lecture you will learn:

- How to access and use the ADDA safety management system
 - Understanding safety management
 - Accident and incident reporting

Safety policy

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- Safety is serious business, and for that reason a safety management system (SMS) is used to enforce best practices and create a safe operating culture
- The FOM addresses risk management - using methods to assess risk and then reduce it.
- Safe practice should be treated as a “culture” and an underlying way of doing things
 - Always view actions as having consequences that could result in compromised safety



Job safety assessment - every flight

- In order to reduce the likelihood of injury and accident, several checks for safe flight operation are completed
 - **FOM Sec 3.4: Risk Assessment** specifies a procedure which is implemented to check the overall risk of the mission, and proceed to flight operations if the risk is below a threshold
 - **The SMS** more broadly discusses the promotion of a safety culture
 - **Before every flight, a standard briefing** is conducted to verify that all crew members are **wearing necessary PPE** for the mission

Safety policy
SMS
OH & S
Hazards
Emerg resp plan



The Safety Management System (SMS) is established to promote a safety culture

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- The SMS outlines RPA safety procedures
- Ensures proper UAS safety procedures are adhered to by all personnel
- Creates a culture of safety within the operations and among the people
- Ensures the proper documentation and recording of all flight safety procedures and incident reports
- Ensures safety related matters are properly communicated through the personnel framework

The SMS defines several areas of activity to support a safety culture

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- **Hazard identification** includes the perception of problems before they occur and what can be done to proactively reduce the likelihood of a hazard becoming something more serious
 - VTOL aircraft have a minimum safe distance of **1m**: a distance that should not be reduced at any time during the launch and recovery operation
- **General operational guidance** is provided by the Aviation Safety Officer who will determine the acceptability of new areas of operation
 - The RPIC and Chief Pilot review all flight requests and provide concurrent acceptance to initiate the flight operation

The SMS defines several areas of activity to support a safety culture

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- **Occupational health and safety (OHS):** Policies are established to protect the well-being of the flight crew (pilots, visual observers and other essential personnel)
- **Emergency response plan (ERP):** The ERP defines a response to an emergency
- **Incident and accident investigation:** the ISC conducts investigations with outcomes reported to the ESRC

Work safety: Occupational Health and Safety (OH&S)

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- The need for safety cannot be underestimated in the operation of drones
 - Any **physical stress** can impact pilot performance
 - **Pilot safeguarding** reduces the likelihood of injury potential
 - **Areas of concern in OH&S include:**
 - Crew fatigue
 - Protection from the elements
 - Dehydration and heat related risks
 - Sun
 - Thunderstorms
 - Personal protective equipment (PPE)
 - Distractions and interference



OH&S: Crew Fatigue

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- Fatigue is a significant risk factor to successful mission completion and overall safety.
 - Pilots that are fatigued do not perform as well and can miss obvious signals indicating a departure from safe flight
 - Hours of pilot rest are a major factor of fatigue

Recommended work/rest guidelines:

- *Maximum duty time - 12 hours per day (this includes any required meetings, standardization flights, ground labs, classes or any other assignment)*
- *Maximum duty time - 70 hours per week*
- *Minimum of 10 consecutive hours of rest during the 24-hour period that precedes the completion of the last activity.*

OH&S: Protection from the Elements

- Dehydration and heat-related risks:
 - Ensure a supply of drinking water is available during flight ops, and breaks are scheduled to access it
 - Effects of dehydration include:
 - Thirst
 - Headache
 - Fatigue
 - Cramps
 - Sleepiness
 - Dizziness
 - Heat exhaustion symptoms include the above, plus low blood pressure, nausea and low fever
 - Heat stroke symptoms include rapid heartbeat and rapid breathing, plus stroke-like symptoms of confusion, hallucinations, seizures and LOC

Safety policy
SMS
OH & S
Hazards
Emerg resp plan



OH&S: Protection from the Elements

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- Sun exposure can cause fatigue
 - Recommend wearing a wide-brimmed hat and sunglasses to improve pilot comfort
- Thunderstorms and the potential hazard of lightning strikes should be monitored
 - Operations should be suspended during a lightning storm and at least 30 minutes after the last lightning strike



OH&S: Personal Protective Equipment

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- Personal protective equipment (PPE) includes equipment that is worn to reduce the risk of RPA-specific hazards.
 - It is required for all operations of RPA within ADDA programs
- Minimum PPE includes:
 - Eye protection
 - Closed toe shoes
 - Sleeved shirts
- Optional equipment depending on the work environment:
 - High visibility vest
 - Gloves
 - Hearing protection



OH&S: Distractions and interference

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- Care should be taken to minimize distractions and interference
- When operating in the proximity of people who are not part of the flight mission, measures should be taken to enhance the safety of the operating environment:
 - Barriers or markers should be put up to separate the flight crew from bystanders
 - Signage is recommended that explains the flight operations (to reduced questions asked of the crew)
 - It may be worthwhile to brief bystanders on the flight operations
 - Additional crew may be brought in to manage crowds
 - Select clothing or high visibility vests may be worn to distinguish the flight crew to others on site

An emergency response plan (ERP) should be developed to improve the efficiency of an emergency response

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- **Chapter 2 of the SMS** describes the **emergency response plan**
- The ERP addresses pilot responsibilities in the event of an emergency
- An **emergency response coordinator (ERC)** is designated as a focus to provide support in managing an emergency response



Emergency procedures quick-reference checklist

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

1. If necessary, call emergency services.
2. Render first aid as necessary.
3. Contact the Chief Pilot or the Project Manager via the call out list.
4. Preserve accident/incident site to ensure aircraft wreckage is not tampered with.
5. Secure the Ground Control Station.
6. Once the flight crew and scene are secure/safe take pictures and begin documentation of the incident.



Procedures in the event of an aircraft crash (SMS §2.6):

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- **The crew and accompanying personnel following an aircraft crash are to:**
 - Protect themselves and others first
 - Make sure that the situation is dealt with in order to prevent further injury and damage
 - Get help from surrounding personnel and bystanders as well as notify any authority figures or emergency services, if required
 - Control the damage caused by the incident and prevent it from spreading
 - Record as much information about the aircraft crash as possible to identify the point of failure, learn from the incident, and avoid similar incidents in the future.

The FOM §3.4 addresses first aid and emergency response equipment

- The **Emergency Response Coordinator** is designated by the Aviation Safety Officer, and will provide the following services at the flying site:
 - First aid kit that includes enough supplies to address most common injuries (cuts and minor lacerations, burns, dehydration)
 - A phone number of the nearest emergency response unit for transportation to a hospital
 - 2l of drinking water
 - Clean patient space to administer first aid
 - A bucket of sand for putting out fires

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

Additional emergency response planning information is available in Chapter 2 of the SMS

Accident and incident reporting is performed to track, learn and improve

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- Tracking of hazards, accidents and incidents is completed through the electronic records system
 - The chief pilot is notified when an event occurs
 - Events that are not considered “typical” (such as a prop strike) will be addressed by the internal safety review committee
- The logging system allows hazards (pre-accident or incident) to be identified both by operators of the aircraft and also by outside observers through the Anonymous Safety Reporting system

Incidents

Any deviation from the planned flight should be recorded in the flight log with no exceptions.

Check any incidents that occurred during the flights

<input type="checkbox"/> NONE	<input type="checkbox"/> Injury	<input type="checkbox"/> Death
<input type="checkbox"/> Property Damage	<input type="checkbox"/> Prop Strike/Tipover	<input type="checkbox"/> Hard Landing
<input type="checkbox"/> Foreign Object Damage	<input type="checkbox"/> Wildlife	<input type="checkbox"/> Airspace Violations
<input type="checkbox"/> Traffic Conflict in Flight	<input type="checkbox"/> Near Midair Collision	<input type="checkbox"/> Procedure Error
<input type="checkbox"/> Human Factor Error	<input type="checkbox"/> Fatigue	<input type="checkbox"/> Fuel/Energy Event
<input type="checkbox"/> Altitude Deviations	<input type="checkbox"/> Loss of Data Downlink	<input type="checkbox"/> Loss of Command Uplink
<input type="checkbox"/> Loss of Telemetry Downlink	<input type="checkbox"/> Other (explain clearly)	

Check all that apply. An incident report is required for any response other than NONE.

Next Page 2 pages left

Hazard identification and documentation

Safety policy
SMS
OH & S
Hazards
Emerg resp plan

- Potential hazards may be observed, but unless there is an accessible reporting system available, they may not be documented
- An open and anonymous safety reporting system (ASR) that anyone can use should be implemented at a flight operation
- The ASR is used to report any safety concerns observed in flight operations
 - All submissions are equally investigated, assessed, and addressed immediately upon receipt by the Safety Committee
 - The ASR form is confidential, and information about how to access it is provided on signage that is displayed on the ADDA premises