Guidance on Inadvertent Slide Deployment Prevention
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1.  **ABBREVIATIONS AND GLOSSARY OF TERMS**

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>ECAM</td>
<td>Electronic Centralized Aircraft Monitor</td>
</tr>
<tr>
<td>EICAS</td>
<td>Engine Indication and Crew Alerting System</td>
</tr>
<tr>
<td>FAP</td>
<td>Flight Attendant Panel</td>
</tr>
<tr>
<td>ISD</td>
<td>Inadvertent Slide Deployment</td>
</tr>
<tr>
<td>L</td>
<td>Left</td>
</tr>
<tr>
<td>PA</td>
<td>Passenger Address</td>
</tr>
<tr>
<td>PIC</td>
<td>Pilot-in-Command</td>
</tr>
<tr>
<td>R</td>
<td>Right</td>
</tr>
<tr>
<td>SCCM</td>
<td>Senior Cabin Crew Member</td>
</tr>
<tr>
<td>SEP</td>
<td>Safety and Emergency Procedures</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>TEM</td>
<td>Threat and Error Management</td>
</tr>
</tbody>
</table>
2. CABIN SAFETY

IATA plays a key role in raising awareness of important cabin safety issues. Cabin safety is a component of an airline safety management program that includes proactive data collection and ensuing prevention activities related to cabin design and operation, equipment, procedures, crew training, human performance, and passenger management. Cabin safety also comprises of all activities that cabin crew must accomplish in order to contribute to the safe and efficient operation of the aircraft during normal, abnormal and emergency situations.

These guidelines are the product of work carried out by the IATA Cabin Safety Operations Task Force (COSTF) which is comprised of safety experts from IATA member airlines, The COSTF is established to develop, promote and improve standards, procedures and best practices to ensure safety and security in all aspects of cabin operations. The representatives are experts in the domain of: Cabin Safety, Cabin Crew Training, Accident and Incident Investigation, Human Factors and Quality Assurance. IATA wishes to thank the IATA Cabin Safety Task Force for their dedication and hard work.

For further information regarding these guidelines contact: cabin_safety@iata.org
3. DEFINITIONS

It is important to have a global and common understanding of the definition of an Inadvertent Slide Deployment, the IATA definition below is very much aligned with the definition provided by A4A (Airlines for America).

**Inadvertent Slide Deployment:** For the purpose of this document an inadvertent slide deployment is the unintentional deployment (full or partial) of an aircraft emergency evacuation slide or slide raft. This includes passenger, main service and upper-deck doors, over-wing slides, and tail slides including tail cones.

Slides or slide rafts deployed during an actual emergency evacuation, deliberate functional tests or, on rare occasions, when there is an equipment malfunction are not considered an inadvertent slide deployment.

**Deployed:** A slide or slide raft will be considered deployed if the door was in an armed configuration when opened and:

1) The slide or slide raft was pulled from its container, or
2) The door-assist bottle was discharged (on aircraft so equipped).

**Note:** The slide or slide raft does not have to inflate to be considered “deployed” by this definition.

3.1 Taxonomy

- Full inadvertent slide deployment
- Partial inadvertent slide deployment
- Inadvertent slide deployment – slide pact intact
4. INADVERTENT SLIDE DEPLOYMENT PREVENTION

In 2004, it was identified that cabin crew were responsible for approximately 60% of all inadvertent slide deployments reported to IATA. Contributing factors to inadvertent slide deployments include, but are not limited to:

- SOP non-compliance
- Fleet management
- Inadequate SOPs
- Lack of training
- Ad hoc situations
- Multi-tasking and workload
- Miscommunication or lack of
- Operational pressure
- Distraction
- Fatigue
- Door design
- Non-routine situations or irregular operations
- Multi-tasking

Although the statistics show a decrease in incidents, inadvertent slide deployments (ISD) are a serious threat to safety as they can cause serious injury or be fatal to people in or around an aircraft, and the financial impact caused by delays and repairs is also significant. An ISD could lead to flight cancellation and the cost for compensation, hotel accommodation, meals etc. can reach up to $200,000 for a single event.

There is no “one size fits all” solution for all operators, therefore the guidelines offers a variety of recommended solutions. Strategies to mitigate this problem revolve mostly around good communication, following operator SOPs, the use of onboard technology, and enhanced training and awareness so that cabin crew have the ability to apply strategies to mitigate the risk of a slide deployment.
5. SAFETY RISK MANAGEMENT

Within the context of aviation safety is: “The state in which the possibility of harm of persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and safety risk management.”

**Hazard:** a hazard is condition, object or activity with the potential of causing injuries to personnel, damage to equipment/structures or loss of material.

**Consequences:** are the potential outcome(s) of the hazard.

5.1 Hazards and consequences

When formulating SOPs, hazards and consequences must be considered.

**Hazards and Consequences:** The table below is a non-exhaustive list of hazards and consequences related to an Inadvertent Slide Deployment:

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>➔ Ineffective communication</td>
<td>➔ Inadvertent slide deployment</td>
</tr>
<tr>
<td>➔ Door opening/closing</td>
<td>➔ Falling from height</td>
</tr>
<tr>
<td>➔ Different aircraft types/procedures</td>
<td>➔ Damage to aircraft and equipment</td>
</tr>
<tr>
<td>➔ Operational environment</td>
<td>➔ Entrapment/injury during normal door operation</td>
</tr>
<tr>
<td>➔ Time pressure</td>
<td>➔ Injury or death</td>
</tr>
<tr>
<td>➔ Distraction</td>
<td>➔ Unserviceability of aircraft and cancellation</td>
</tr>
<tr>
<td>➔ Insufficient training</td>
<td>➔ compensation with payment to customers</td>
</tr>
<tr>
<td>➔ Unclear SOPs</td>
<td>➔ Slide repair(s) servicing costs</td>
</tr>
<tr>
<td>➔ Irregular or abnormal operations e.g. diversions, ferry flights, return to stand/gate</td>
<td>➔ Delays</td>
</tr>
<tr>
<td>➔ Fatigue</td>
<td>➔ Media interest</td>
</tr>
<tr>
<td>➔ Technology</td>
<td></td>
</tr>
</tbody>
</table>

5.1.1 ⚠️ Dealing with different SOPs

Cabin crew are often qualified to operate more than one type of aircraft and may even operate more than one aircraft type during the same flight duty period as per their pairing/roster. Different SOPs according to the aircraft type may lead to confusion and negative transference. Negative transference occurs when a skill acquired for one task disturbs a new task. This phenomenon can be observed when an operator has SOPs that vary according to the aircraft type and cabin crews operate these different types on a regular basis.
Operators with procedures to open passenger cabin doors from the outside report a lower rate of inadvertent slide deployments per year. When establishing door opening procedures, Operators should consider the following factors:

- Fleet composition: mixed fleet flying and type variants
- Operational environment
- Ground crew competency and availability

Ground crews often service various airlines that have differing door opening procedures. Some airlines permit the ground staff to open the doors from the outside, others do not. This can be a potential for confusion amongst the ground personnel ultimately resulting in an error and should be taken into consideration when developing a policy and procedures, for training purposes and as a possible contributing factor during an incident investigation.

5.1.2  

⚠️ Dealing with mixed fleet

Most modern aircraft doors are disarmed automatically when opened from outside. Some aircraft types (e.g. Boeing 737) have doors that cannot be disarmed automatically when opened from outside. If an operator has these aircraft types in its mixed fleet, doors are generally disarmed and opened by the cabin crew.

**Note:** The operator should choose whether to apply a “doors opened from outside” based on its aircraft fleet.

5.1.3  

⚠️ Dealing with types and variants

Some aircraft types/variants (e.g. Avro Regional Jet or Boeing 737) may be fitted with air stairs that need to be opened from inside.

**Note:** The operator should choose whether to apply a “doors opened from inside” based on the aircraft types/variants in its current fleet.

5.1.4  

⚠️ Operational environment

Some aircraft often operate to remote stands where ground crew is not available or qualified to open doors from the outside. The operator must choose whether to apply a “doors opened from outside” based on the operational environment and available resources throughout its network.

**Note:** The operator should choose whether to apply a “doors opened from inside” based on the operational environment.
5.1.5  ❱ Ground crew competency

If an operator chooses to apply “doors opened from outside”, ground crew need to be proficient in all of the operator’s aircraft types and sufficient ground crew must be available throughout the network. The training of ground crew could be justified by the savings obtained through inadvertent slide deployment reduction. The IATA Airport Handling Manual (AHM) was been developed to assist the industry in the provision of safe, effective and quality services at lower cost.

For the complete and most up to date guidance related to the AHM and to order the IATA Airport Handling Manual (AHM) manual please go to the following link: www.iata.org/publications/Pages/ahm.aspx

Note: In case of diversion into an airport which is not part of the operator’s network, cabin crew should follow their SOPs to open the door from inside or outside as directed by the PIC.
6. ESTABLISHMENT OF STANDARD OPERATING PROCEDURES (SOPS)

SOPs should include the following:

- Crew composition (minimum cabin crew)
- Door components and their functions for each aircraft type in the operators fleet
- Door operating procedures
- Departure and arrival procedures and duties (arming/disarming)
- Communication and coordination
- Human factors and prevention strategies
7. DOOR COMPONENTS

The operators Cabin Safety and Procedures Manual should describe the following door components and their functions:

- Slide or Slide raft container/bustle (gas bottle pressure gauge, if applicable)
- Door control handle
- Window
- Gust lock
- Assist handle
- Arming/disarming system
- Observation window (locking indicator, if applicable)
- Door locking mechanisms
- Flags and/or indicators (if applicable)
- Door bustle release handle (if applicable)
- Door warning system (if applicable)
- Power assist system (if applicable)
- Door safety strap
8. DOOR OPERATING PROCEDURE

Cabin doors can be opened from inside or outside but should only be operated by specially trained and qualified staff. An operator should choose whether to apply door opening from inside, door opening from outside or a mixed procedure. This will depend on aircraft type and variants in its current fleet and the evaluation of hazards and consequences.

**Note:** No cabin doors should be opened or closed without ground equipment in place.

**Note:** Some aircraft have integral stairs, where the first action is to open the door and ensure there is NO ground equipment around that can interfere. On aircraft equipped with integral stairs, the door needs to be open to allow power to the steps or for the steps to be available.

8.1 Door operating responsibilities

Airlines and ground handling agents must know who is responsible for door operations (opening from inside or outside). Whether doors are opened from inside or outside, an operator should have clearly defined SOPs as per the responsibilities within the cabin.

It is important to assign door responsibility in order of prioritization as per the cabin crew requirements on board. Cabin crew positions are usually assigned during the pre-flight briefing from the senior cabin crewmember. During the pre-flight briefing it is also important to review the door arming and disarming procedures, as well as the door operation procedures in a normal operation and emergency situation.

For the identification of floor level doors we recommend to use:

- The letter R for right and L for left to indicate the side of the aircraft as seen in the direction of flight; and
- A figure starting with 1 to identify each set of doors from the front to the back of the aircraft. Below we see Doors 1L and 1R and Doors 2L and 2R.
Cabin crew seat position and numbering can correspond to the door designator to define the area of responsibility. Depending on the crew composition or aircraft type a cabin crew member may be responsible for two doors (1 left and 1 right), or have no door responsibilities.

In accordance with the operators SOPs, cabin crew assigned to a door should conduct the pre-flight checks, the opening/closing of the assigned door(s), and are responsible for arming/disarming the assigned door(s).

Cabin crew would perform these duties only if ordered by the flight deck or the SCCM.

Operators should require cabin crew to remain at their assigned door(s) during taxi, unless they are performing safety related duties.

Communication with other crew members or passengers should be done over the interphone or the passenger address system.

8.2 Door opening from inside

Cabin crew assigned the opening of a door(s) must wait until the ground equipment is in place and for ground personnel to give “two knocks” by hand on the outside of the door.

- **Note:** If the ground staff has knocked on the cabin door and there is no response from the cabin crew a slow count of 10 should be made and the above procedure must be repeated.

The Cabin Crew shall give a slow count of 10 to allow ground staff time to retreat and cabin crew should check via the window on the door to ensure the ground staff is in a safe position before the door(s) is opened.

Cabin crew assigned the opening of a door(s) should check that the steps or loading bridge are correctly positioned and both guardrails are extended before passengers are permitted to disembark. For aircraft with integral stairs, cabin crew should check with flight crew prior to door opening to ensure coordination and the safety of ground staff.

For those doors that require to be opened to assist in functions such as catering and cleaning of the aircraft, the ground staff should follow the same procedure. If still no response is received, only ground staff that are trained and authorized in cabin door operation may then approach the cabin door with caution and open the door from the outside according to procedures.
8.3 Door opening from outside

- Ground personnel responsible for opening doors must ensure that the passenger loading bridge or platform is securely in place.
- Two knocks must be given to indicate to the cabin crew that the door is required to be opened. After having checked that the door is in disarmed mode and also verifying that the cabin pressure (where applicable) is not flashing, cabin crew should give a “thumbs up” for 5 slow seconds and stand back for 5 slow seconds (Total 10 seconds). Cabin crews are not to assist in opening the door in any way as attempting to assist could cause injuries.
- Ground personnel should allow cabin crew sufficient time to step away from the door, count 10 slow seconds. If applicable, prior to opening the door, the ground staff should ensure that the door is disarmed and the aircraft depressurized.
- If ground staff have knocked twice on the cabin door and there is no response from cabin crew, ground staff trained and authorized in cabin door operation may then approach the cabin door with caution and open the door from the outside according to procedures.

8.4 Door closing

- The flight crew should give the permission to close the main boarding door. If the senior cabin crewmember is ready to close the boarding door, they should check with the flight crew (in person or via the interphone depending on boarding door proximity to the flight deck and on company security measure procedures). Upon affirmative confirmation from the flight crew the boarding door may be closed. Example:
  - SCCM: “CAPTAIN REQUEST CLEARANCE TO CLOSE DOORS”
  - PIC: “CLEAR TO close DOORS”
- Checking with the flight crew is to coordinate and mitigate the additional unnecessary reopening of doors.
- Before closing cabin doors, cabin crew should look out for any possible obstructions around the door area that may hinder the closure of the door. In order to preclude the possibility of injury and where it is reasonably practicable to do so, assistance from outside the aircraft must be given in the initial closing of cabin doors. Ground personnel should not leave the vicinity of the cabin door until it is fully closed, seated in the recess and the handle is stowed.
8.5 Re-opening of cabin doors

Situation also referred to as unusual, “ad hoc” or irregular operations may require that doors be re-opened. Examples of specific situations may be additional catering, passenger, return to stand etc. Specific (unusual) situations may disturb the everyday routine and cabin crew may feel in an out-of-sequence situation and hence contribute to human error. It is therefore of utmost importance that established SOPs are followed and particular attention be made to avoid distractions.

Reopening of aircraft doors: Once all the doors have been closed for departure, no attempt must be made to re-open any door without the specific authority of the PIC. Cabin Crew should never open door(s) before the SCCM has been in contact with the PIC. All Cabin Crew should refrain from opening doors until requested to do so by the SCCM. The PIC and the SCCM should coordinate on which door(s) need to be re-opened and communicate this to all Cabin Crew.

Operators may choose to disarm only the door which requires opening. The flight deck or the SCCM should advise the cabin crew member assigned to that specific door that the door must be re-opened. The cabin crew member at the specific station should follow SOPs for disarming the slide/raft and confirm to the SCCM once slide is disarmed. Flight deck and SCCM should crosscheck with onboard technology (ECAM / EICAS and FAP) if applicable and advise if door is clear to open.

8.5.1 Cabin crew require door(s) to be re-opened

Senior cabin crew member should advise flight crew that reason and specific door(s) to be re-opened. Flight crew should contact the ground personnel to request re-opening of the doors. Ground personnel and cabin crew must then follow the correct door opening procedure.

8.5.2 Ground personnel require door(s) to be re-opened

Irrespective whether service equipment has been removed, ground personnel must contact the flight crew. All ground staff and cabin crew must then follow the procedures within this policy. If the steps/passenger loading bridge is still in place, ground staff should follow the correct door opening procedures.
9. DEPARTURE AND ARRIVAL DUTIES

SOPs must specify that cabin crew are not permitted to arm or disarm the door(s) without the order of the flight deck or the SCCM. The order to arm or disarm should be given via the public address (PA):

- “Cabin crew prepare doors for arrival/departure and crosscheck” or a similar command; or
- The operator can implement a three-step PA. The PA tells the cabin crew exactly what tasks need to be executed and the sequence to carry them out. Between each of the steps the flight crew or the SCCM must pause, to enable the cabin crew to execute the designated task:
  - “Cabin crew to your station” (2 second pause);
  - “Please prepare doors for arrival/departure” (2 second pause);
  - “And crosscheck the opposite door”.

Cabin crew would arm or disarm door(s), as applicable and cross check opposite door. This is followed by an all stations call via the interphone by the SCCM to confirm that all doors are disarmed and crosschecked.

9.1 Stop Drop Review

There is a link between ISD’s and distraction, fatigue, stress, complacency and other Human Factors. In order to mitigate these, cabin crew should use the “Stop – Drop – Review” method. This is a quick silent review prior to door arming/disarming (as applicable) with a focus on using proper SOPs.

Arming Door:

- Stop everything you are doing and focus on the door.
- Drop your hands and let your eyes touch the door first.
- Review the door arming and disarming procedures.
- Push arming level down to the ARMED position.
- Ensure door is armed.
- Crosscheck assigned doors.
- Stand by for “All Call/Interphone Call”.

Disarming Door:

- Stop everything you are doing and focus on the door.
- Drop your hands and let your eyes touch the door first.
- Review the door arming and disarming procedures.
- Pull arming level up to the disarmed position.
- Ensure door is disarmed.
- Crosscheck assigned doors.
- Stand by for “All Call/Interphone Call”.
9.2  Preparing doors for departure

When the means of entry has been removed and on hearing the PA announcement: “Cabin crew prepare doors for departure and crosscheck”:

- Cabin crew should proceed to assigned door and “Stop-Drop-Review.”
- Cabin crew should conduct arming procedures, according to established SOPs and should then check the door “armed” status.
- Primary Crew shall ARM the door under their control.
- Cabin crew should crosscheck the opposite door by walking across the cabin with a close up visual check or via “thumbs up” signal to cabin crew member at opposite door. Cabin crew should confirm arming to the SCCM via the interphone.
- The interphone confirmation should be done by each door operator as a “crosscheck” from the front to aft of the cabin and, if applicable, then to the upper deck of the aircraft again from front to aft (e.g. B747 or A380).
- SCCM should check the doors status with on board technology (e.g. FAP Flight Attendant Panel), if available on specific aircraft type.
- Flight crew should check the doors status with on board technology (e.g. ECAM / EICAS), if available on specific aircraft type.

Note: If confirmation of the door status was not received, SCCM should call the station to receive confirmation door is armed.

9.3  Preparing doors for arrival

Operators may choose to disarm the door(s) slides/rafts when the aircraft makes the final turn toward the parking bay or when the aircraft has come to a complete stop (engine shutdown) and the seatbelt sign is turned off. The SOPs should specify whether the PA announcement should be made by the SCCM or the flight deck. On hearing the PA announcement: “Cabin crew prepare doors for arrival and crosscheck”:

- Cabin crew should proceed to assigned door and “Stop-Drop-Review”.
- Cabin crew should conduct disarming procedures, according to established SOPs and should then check the door “disarmed” status.
- Cabin crew should crosscheck the opposite door by walking across the cabin with a close up visual check or via “thumbs up” signal to cabin crew member at opposite door.
- Cabin crew should confirm disarming to the SCCM via the interphone. The confirmation should be done by each door operator as a “crosscheck” from the front to aft of the cabin and, if applicable, to the upper deck from front to aft.
- SCCM should crosscheck all door status’ with the on board technology (e.g. FAP Flight Attendant Panel), if available on specific aircraft type.
- Flight crew should crosscheck the doors status with on board technology (e.g. ECAM or EICAS) if available, on specific aircraft type and switch off the seatbelt sign.
- Doors must not be opened until the seatbelt sign is switched off and flight crew or SCCM have advised which door(s) are clear to open.
Note: If for any reason, no order for disarming the doors has been received from the flight crew or SCCM as per SOPs, the SCCM shall contact the flight crew and/or a cabin member shall contact the SCCM.

If confirmation of the door status was not received, the SCCM should call the cabin crew station to receive confirmation door is disarmed.

9.4 Opening of cabin doors by cabin crew with door operator and door checker

Some operators have a door opening from the inside procedure that involves both a Door Operator and a Door Checker. For this, two cabin crew members must be present when opening cabin doors during normal operations. One shall be the ‘Door Operator’, the other should act as a ‘Door Checker’, who must be a SCCM.

The Door Operator must:

- Not rush reactively to open the door;
- Visually check and ensure door status is in DISARMED mode;
- Verbally state: ‘DOOR DISARMED’, to be heard by the Checker;
- Open the door after hearing the Checker’s ‘clear to open door’.

The Door Checker must:

- Visually check and ensure door status is in DISARMED mode;
- Verbally confirm to Operator ‘door DISARMED’;
- Advise Operator, ‘clear to open door’.

The Door Checker should remain present close to the arming lever where the door opening can be closely observed. At any time during the process, should the Door Operator inadvertently reach for the arming lever or the door opening handle when not appropriate as per SOPs, the Door Checker must verbally warn and/or physically intervene to prevent any inadvertent action.
10. COMMUNICATION AND COORDINATION

The importance of effective communication and coordination between flight and cabin crew is of utmost importance. Communication, in addition to its most widely perceived function of transferring information, enhances situational awareness, allows problem solving to be shared amongst crew members by enabling individual crew members to contribute appropriately and effectively to the decision-making process. Inadequate communications between crew members and other parties such as ground personnel, may lead to a loss of situational awareness, a breakdown in teamwork and ultimately to a bad decision or series of decisions which result in a serious incident or even a fatal accident.

10.1 Communication and coordination for door opening

<table>
<thead>
<tr>
<th>Event</th>
<th>Flight Deck</th>
<th>Cabin Crew</th>
<th>Ground Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door opening from inside</td>
<td>Check ECAM / EICAS (if applicable) and switch off fasten seat belt sign. Advise: “Doors clear to open” to cabin crew or SCCM</td>
<td>Receive doors clear to open from flight deck or SCCM. On hearing two knocks on the door, check via door window that area is clear and support platform is in place, and open door.</td>
<td>Position ground equipment, knock twice on the door and retreat to a safe position.</td>
</tr>
<tr>
<td>Door opening from outside</td>
<td>Check ECAM / EICAS (if applicable) and switch off fasten seat belt sign. Advise: “Doors clear to open” to cabin crew or SCCM</td>
<td>Receive doors clear to open from flight deck or SCCM. On hearing two knocks on the door, check that the door is in disarmed mode, give a “thumbs up” in the door window and step away from the door.</td>
<td>Position ground equipment, knock twice on the door, receive “thumbs up”, count to 10 and before opening door</td>
</tr>
</tbody>
</table>

10.2 Communication and coordination for door closing

<table>
<thead>
<tr>
<th>Event</th>
<th>Flight Deck</th>
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<tbody>
<tr>
<td>Door closing</td>
<td>Give permission to SCCM or make a PA to close door(s)</td>
<td>Receive doors clear to close from flight deck or SCCM. Check support platform is in place, check for any possible obstruction before closing the door, close door as per SOPs.</td>
<td>Assist from outside the aircraft in the initial closing (if applicable). Wait until door is fully closed, seated and the handle is stowed.</td>
</tr>
</tbody>
</table>
### 10.3 Communication and coordination for door re-opening

<table>
<thead>
<tr>
<th>Event</th>
<th>Flight Deck</th>
<th>Cabin Crew</th>
<th>Ground Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door re-opening requested by cabin crew</td>
<td>Contact ground personnel to request door re-opening. Advise SCCM or specific station to disarm slide. Check ECAM / EICAS (if applicable) and advise “Doors clear to open”.</td>
<td>Receive information from flight deck or SCCM which specific door(s) must be re-opened. Follow disarming procedure; check door is in “disarmed” mode. Upon hearing two knocks on the door, check via door window that area is clear and support platform is in place, and open door or give thumbs up (opening from outside) and step away from the door</td>
<td>Receive information from flight deck that door must be re-opened. Position ground equipment (if applicable) and knock twice on the door. Retreat to a safe position (opening from inside) or receive thumbs up (opening from outside)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Event</th>
<th>Flight Deck</th>
<th>Cabin Crew</th>
<th>Ground Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door re-opening requested by ground personnel</td>
<td>Receive information from ground personnel that door must be re-opened. Advise SCCM to advise specific station to disarm door(s). Check ECAM / EICAS (if applicable) and advise “Doors clear to open”.</td>
<td>Receive information from flight deck or SCCM that door must be re-opened. Follow disarming procedure, confirm slide is disarmed and receive door clear to open. On hearing two knocks on the door, check via door window that area is clear and support platform is in place, and open door or give thumbs up (opening from outside)</td>
<td>Contact flight deck and inform that that door must be re-opened. Position ground equipment (if applicable) and knock twice on the door. Retreat to a safe position (opening from inside) or receive thumbs up (opening from outside)</td>
</tr>
</tbody>
</table>
### 10.4 Communication and coordination for disarming and arming slides

<table>
<thead>
<tr>
<th>Event</th>
<th>Flight Deck</th>
<th>SCCM</th>
<th>Cabin Crew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door disarming</td>
<td>When the aircraft makes a final turn toward the parking bay or when the aircraft comes to a complete stop make a PA: “cabin crew prepare doors for arrival” (or a similar command) Check ECAM / EICAS (if applicable), make a PA or advise SCCM doors clear to open”.</td>
<td>If disarming command is given by the SCCM, the PA should be made once the aircraft has come to a complete stop. On receiving confirmation from each station that slides are disarmed, check door status on FAP (if applicable) and advise “doors clear to open” (if applicable)</td>
<td>On hearing the PA cabin crew should disarm slides, check status and crosscheck opposite door. Confirm disarming to SCCM via the interphone and wait until PA or interphone call confirms: “doors clear to open”</td>
</tr>
<tr>
<td>Door arming</td>
<td>The flight deck should inform the SCCM or make a PA: “Prepare doors for departure” (or a similar command). Flight deck should crosscheck door status on ECAM / EICAS (if applicable)</td>
<td>If arming command is given by the SCCM, the PA should be made after the advice from flight deck. On receiving confirmation from each station that slides are armed, check door status on FAP (if applicable)</td>
<td>On hearing the PA cabin crew should arm slides, check status and crosscheck opposite door. Confirm arming to SCCM via the interphone.</td>
</tr>
</tbody>
</table>
11. HUMAN FACTORS IN SLIDE DEPLOYMENT

Awareness should be raised that human factors may contribute to an inadvertent slide deployment. Human factors involve gathering information about human abilities and limitations, and applying it to produce safe and effective human use. That understanding should be translated into training, policies, or procedures to help humans perform better. Improving human performance can help the industry to reduce inadvertent slide deployment.

11.1 Threat and Error Management (TEM)

Threat and Error Management is an overarching safety concept regarding aviation operations and human performance. The TEM framework is a conceptual model that assists in understanding the inter-relationship between safety and human performance in dynamic operational contexts. It helps operators to capture data from everyday flights and as well as from incidents and accidents. With this data, operators can develop information that assists in understanding strengths and weaknesses, clarify human performance needs thus contributing to improve the effectiveness of its training interventions, and consequently to an efficient safety management of cabin operations.

The basic components of the TEM framework are:

- Threats – generally defined as events or errors that occur beyond the influence of cabin crew, increase operational complexity, and which must be managed to maintain the margins of safety.
- Errors – generally defined as actions or inactions by cabin crew that lead to deviations from organizational or cabin crew intentions or expectations. Unmanaged and/or mis-managed errors frequently lead to undesired states. Errors in the operational context thus tend to reduce the margins of safety and increase the probability of an undesirable event.
- Undesired states – generally defined as operational conditions where an unintended situation results in a reduction in margins of safety. Undesired states that result from ineffective threat and/or error management may lead to compromised situations and reduce margins of safety aviation operations.
- End state – final event that completes the incident/accident sequence. An end state can be responded to, but margins of safety are not recoverable. There is no going back.

Originally developed for flight deck operations, the TEM framework can nonetheless be used at different levels and sectors within the aviation industry. The TEM model can be used as an analytical tool to determine potential threats, errors and undesired states that can lead to incidents. TEM findings can be used to develop prevention strategies that are particular to your current safety issues.
11.1.1 Threat and Error Management in Slide Deployment

A threat analysis was conducted based on the slide deployment statistics to determine the contributing factors of inadvertent slide deployment. The objective of the analysis is to produce effective management strategies and tools to prevent slide deployments. The following threats and errors were identified:

**Threats:**
- Ad hoc situations such as door re-opening, ferry flights, last minute catering, reassignment of door responsibilities
- Flight crew errors (omitted to give disarming procedure)
- Multi-tasking workload
- Time pressure (slots, refueling stops, short turnaround)
- Distraction
- Fatigue

**Errors:**
- Handling errors (activation of door-opening handle instead of disarming lever)
- Procedural errors
- Undesired states:
  - Door left armed after crew deplaned
  - Door opening in armed mode
12. PREVENTION STRATEGIES

The following prevention strategies should be combined and considered to maintain safety margins and to avoid inadvertent slide deployment:

- Establishment of policies and procedures
- Cabin crew training
- Establishment of memory aids

12.1 Establishment of memory aids

The establishment memory aids such as acronyms, door placards and checklists are commonly used in aviation. Checklists and acronyms should provide basic information to operate doors. Memory aids should describe actions and keep cabin crew task-minded. They should be established according to aircraft types and SOPs to perform door operating procedures.

12.1.1 Acronyms

An acronym is a word formed from the initial letter or letters of each of the successive parts or major parts of a compound term or series of terms. Acronyms are used frequently to verify that routine tasks are performed properly and that a specific series of tasks are executed in a precise order.

12.1.2 Door placards

Placards provide basic information for cabin crew to operate door components. They should be located on the door to ensure that a cabin crew member sees them prior to operating the door. Placards should provide simple pictorials as visual information of actions and their consequences. They should not be complex nor distract from visual instructions related to emergency door opening.

12.1.3 Checklists

Below are samples of both a door disarming checklist and a door arming checklist (Airbus fleet). It is recommended for airlines to check with the aircraft manufacturer for all aircraft within their fleet to obtain similar and up to date checklists.
<table>
<thead>
<tr>
<th>Table 1 - Example of a door disarming checklist (Airbus fleet)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cabin Crew in Charge</strong></td>
</tr>
<tr>
<td><strong>Pre-disarming procedure</strong></td>
</tr>
<tr>
<td>If the command is given by the cabin crew in charge:</td>
</tr>
<tr>
<td>Make PA announcement once the aircraft has come to a</td>
</tr>
<tr>
<td>complete stop: “Prepare doors for arrival”</td>
</tr>
<tr>
<td><strong>Disarming procedure</strong></td>
</tr>
<tr>
<td>Remove safety pin located in the door support arm</td>
</tr>
<tr>
<td>Insert pin next to the slide selector</td>
</tr>
<tr>
<td>Check that the door is in DISARMED mode</td>
</tr>
<tr>
<td><strong>Cross check procedure</strong></td>
</tr>
<tr>
<td>Walk across to opposite door</td>
</tr>
<tr>
<td>Visually check if selector is in DISARMED mode</td>
</tr>
<tr>
<td><strong>Post disarming communication procedure</strong></td>
</tr>
<tr>
<td>Receive and respond to calls from other stations</td>
</tr>
<tr>
<td>Receive confirmation that all doors are disarmed</td>
</tr>
<tr>
<td>Call stations that have not reported the door status</td>
</tr>
<tr>
<td><strong>Check door status on the FAP</strong></td>
</tr>
<tr>
<td>Call station if any doors appear in ARMED mode</td>
</tr>
<tr>
<td>Call Flight Crew and confirm “doors disarmed”</td>
</tr>
<tr>
<td><strong>Cabin Crew Members</strong></td>
</tr>
<tr>
<td><strong>Pre-disarming procedure</strong></td>
</tr>
<tr>
<td>On hearing the PA from the cabin crew in charge:</td>
</tr>
<tr>
<td>“Prepare doors for arrival”</td>
</tr>
<tr>
<td>Proceed to your assigned door</td>
</tr>
<tr>
<td><strong>Disarming procedure</strong></td>
</tr>
<tr>
<td>Remove safety pin located in the door support arm</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>Walk across to opposite door</td>
</tr>
<tr>
<td>Visually check if selector is in DISARMED mode</td>
</tr>
<tr>
<td><strong>Post disarming communication procedure</strong></td>
</tr>
<tr>
<td>Call cabin crew in charge</td>
</tr>
<tr>
<td>Confirm disarming of the door</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2 - Example of a door arming checklist (Airbus fleet)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cabin Crew in Charge</strong></td>
</tr>
<tr>
<td><strong>Pre-arming procedure</strong></td>
</tr>
<tr>
<td>If the command is given by the cabin crew in charge:</td>
</tr>
<tr>
<td>Make PA announcement</td>
</tr>
<tr>
<td>“Prepare doors for departure”</td>
</tr>
<tr>
<td><strong>Arming procedure</strong></td>
</tr>
<tr>
<td>Remove safety pin next to the slide selector</td>
</tr>
<tr>
<td>Move slide selector to ARMED mode</td>
</tr>
<tr>
<td>Insert pin into the door support arm</td>
</tr>
<tr>
<td>Check that the door is in ARMED mode</td>
</tr>
<tr>
<td><strong>Cross check procedure</strong></td>
</tr>
<tr>
<td>Walk across to opposite door</td>
</tr>
<tr>
<td>Visually check if selector is in ARMED mode</td>
</tr>
<tr>
<td><strong>Post arming communication procedure</strong></td>
</tr>
<tr>
<td>Receive and respond to calls from other stations</td>
</tr>
<tr>
<td>Receive confirmation that all doors are armed</td>
</tr>
<tr>
<td>Call stations that have not reported the door status</td>
</tr>
<tr>
<td><strong>Check door status on the FAP</strong></td>
</tr>
<tr>
<td>Call station if any doors appear ARMED</td>
</tr>
<tr>
<td>Call Flight Crew and confirm “doors armed”</td>
</tr>
<tr>
<td><strong>Cabin Crew Members</strong></td>
</tr>
<tr>
<td><strong>Pre-arming procedure</strong></td>
</tr>
<tr>
<td>On hearing the PA from the cabin crew in charge:</td>
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<tr>
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<td>Proceed to your assigned door</td>
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</tr>
<tr>
<td><strong>Post arming communication procedure</strong></td>
</tr>
<tr>
<td>Call cabin crew in charge</td>
</tr>
<tr>
<td>Confirm arming of the door</td>
</tr>
</tbody>
</table>

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13. POST-INCIDENT INVESTIGATION AND HANDLING

It is important to actively encourage all aspects of safety reporting, within a non-punitive reporting culture, where acceptable standards of behaviour are established and promulgated.

All safety incidents are deemed non-punitive, unless the investigation reveals that the SOPs were contravened intentionally. Focus on the intent. The key to determining whether an act was intentional or not, is to assess the intent of the crewmember. Assess whether their actions were conducted by error or with intent. In most cases, it is human error.

13.1 Senior Cabin Crew Reporting Actions

It is important that the SCCM contact the Cabin Crew Duty Manager as soon as possible after the event.

- The senior cabin crew member must complete a safety report as soon as practicably possible. This should outline the incident chronologically, stating actions of individuals involved, their impact and other influencing factors at the time.
- Where possible, photo images of the door status should be taken and provided as part of the cabin safety investigation and submitted/emailed to the appropriate department.

13.2 Case management

The case management of a full, partial or slide pack intact inadvertent slide deployment should be affected by whether the event occurred at the air operator’s base or at outstations. Suggested procedures could include:

**Base Departure:** Following a report or alert provided by the senior cabin crew member and flight crew, the involved crew member (s) should be removed from duty and debriefed by the Cabin Crew Duty Manager. Where possible a Manager Cabin Safety should also be present. After the cabin crew debrief, the Cabin Safety team should initiate the Safety investigation Report.

**Arrival Base:** The same debrief process should be applied as (above) once the crews have returned to base. For any inadvertent slide deployment events that occur on arrival back into base, the Duty Manager should be informed and the process, as detailed as (above) should apply.

**Outstation:** In the event of an incident, the company may advise the involved crew member(s) to deadhead back to base. The same debrief process should be applied as above, once the crew members have returned to base.
13.3 Safety investigation

The cabin crew involved in the incident should attend a cabin safety debriefing with their Cabin Safety Division. The investigation protocols should be followed as part of the investigation and could be conducted by the Duty Manager in the absence of a Cabin Safety manager.

It is recommended that the following process be followed when there is a report of a Full, Partial or Slide Intact Inadvertent Slide Deployment. A safety investigation should be initiated and the event fully investigated. The outcome should be determined after all factors have been taken into consideration.

Investigation Protocol

The aim of the interview is to obtain relevant and accurate information and to reconstruct the event, thus establishing how it occurred. The investigation report should be prepared in accordance with International Civil Aviation Organization (ICAO) Annex 13 Aircraft Accident and Incident Investigation. The ICAO Annex 13 report format reflects four main sections:

1) Synopsis (Overview)
2) Factual Information: Provides factual information that is relevant to understanding the chronology and circumstances of this occurrence.
3) Analysis: Reviews, evaluates and analyses the factual information presented in the part one, factual information of the investigation. This varies from theoretical analysis to laboratory and full scale testing.
4) Conclusion: Based on the analyses of the factual information, presents the findings and the causal factors.

Findings are statements of all significant conditions, events or circumstances in the accident sequence. The findings are significant steps in the accident sequence, but they are not always causal of indicate deficiencies.

Causes are actions, omissions, events, conditions, or a combination thereof, which led to this accident.

Contributing factors are actions, omissions, events, conditions, or a combination thereof, which, directly contributed to the Accident and if eliminated or avoided, would have reduced the probability of this Accident occurring, or mitigated the severity of its consequences.

Recommendations and Action plan:

Based on the findings of the investigation, safety recommendation and corrective actions are proposed in order to eliminate or mitigate safety deficiencies, and to record the main actions already taken or to be initiated by the affected stakeholders involved.

Once the Safety Report has been completed, it is usually be sent to the executive inflight management.
13.4 Cabin Crew Management

Upon receipt of the Cabin Safety Investigation Report, Cabin Crew Management should determine the appropriate outcome. This could include:

- Cabin Crew Off Duty during Investigation (Grounded without prejudice)
- Requirement for further training
- No further action

Requirement for Further Training

As a combined effort to address any training requirements, the crew member(s) should undergo training and briefings as recommended by the cabin safety investigation and resulting report and the SEP Training Department.

A meeting should be held with their Cabin Crew Manager(s) to determine their suitability to be returned to duty.

No Further Action

A meeting should be held with their Cabin Crew Manager(s) where the importance of safety performance is emphasized and the cabin safety investigation findings, as recorded in the report, are discussed. The crew member(s) should then be returned to duty.
Once the crew member(s) have returned to duty, a follow-up discussion should take place, for example, after one month, with their Cabin Crew Manager. This should focus on what they have learned and address any further concerns that exist.

**Disciplinary Action**

Disciplinary action should only be considered for acts that are found to be intentional or negligent.

**13.4.1 Door Refresher Training**

**Safety and Emergency Procedures (SEP) - Door Evaluation**

If further training is recommended, the cabin crewmember(s) should be advised that they must report to the Safety and Emergency Procedures (SEP) Training Department where they should be required to complete an SEP door evaluation programme. The door evaluation should consist of both a verbal and a practical assessment.

**Verbal Assessment**

The crew member(s) should be required to demonstrate competence by being fully conversant with relevant Standard Operating Procedures (SOPs) and associated terminology. It is recommended that they be questioned and assessed on their knowledge on the following topics:

- Door Identification
- Door ownership policy
- Pre-flight checks
- Applicable door systems (as per Aircraft Type)
- Door Operation SOPs
- Non-standard situations

**Practical Knowledge Assessment**

The crew member(s) should be required to demonstrate competence in applying the relevant Standard Operating Procedures and techniques for door operation in normal, emergency and abnormal situations. They should be assessed on their ability and knowledge to carry out the following:

- Pre-flight check
- Door arming procedure
- Door dis-ariming procedure
- Response to residual pressure indications (relevant aircraft type only)
- Door opening procedure & SOPs
- Door closing procedure
- Emergency Operation Response to Emergency Power Assist, Power Assist Failure, Response to Slide/Raft inflation, Emergency Slide Inflation Failure
- Slide/Raft or Emergency Slide disconnection
The crew member(s) should be fully conversant and able to respond to all PAs and communication related to door operation; both standard and non-standard.

At the end of the door evaluation program the training evaluation report should be sent to Group Safety and the owning Cabin Crew Manager(s). This report should be included in the Safety Investigation.
14. **IMPORTANT NOTE**

There is no “one size fits all” solution, and these guidelines offer a variety of recommended solutions. Operators should customize their training material according to their standard operating procedures and aircraft type.