FLIGHT SAFETY FOUNDATION

ALAR

APPROACH-AND-LANDING ACCIDENT REDUCTION

TOOL KIT

FSF ALAR BRIEFING NOTE 1.4

Standard Calls

Standard phraseology is essential to ensure effective crew communication, particularly in today's operating environment, which increasingly features:

- Two-person crew operation; and,
- Crewmembers from different cultures and with different native languages.

Standard calls — commands and responses — are designed to enhance overall situational awareness (including awareness of the status and the operation of aircraft systems).

Standard calls may vary among aircraft models, based upon flight deck design and system designs, and among company standard operating procedures (SOPs).

Statistical Data

The Flight Safety Foundation Approach-and-landing Accident Reduction (ALAR) Task Force found that an absence of standard calls was a factor in approach-and-landing accidents and serious incidents worldwide in 1984 through 1997 that were attributed, in part, to failure in crew resource management (CRM).[1] Sixty-three percent of the 76 accidents and serious incidents during the period involved failure in CRM as a causal factor.[2]

Use of Standard Calls — General Rules

Standard calls should be *alerting*, so that they are clearly identified by the pilot flying (PF) or pilot not flying/pilot monitoring (PNF/PM), and should be distinguished from communication within the flight deck or between pilots and controllers.

Standard calls reduce the risk of tactical (short-term) decision-making errors (in selecting modes or entering targets [e.g., airspeed, heading, altitude] or in setting configurations).

The importance of using standard calls increases with increased workload.

Standard calls should be practical, concise, clear and consistent with the aircraft design and operating philosophy.

Standard calls should be included in the flow sequence of the manufacturer's SOPs or the company's SOPs and with the flight-pattern illustrations in the aircraft operating manual (AOM).

Standard calls should be performed in accordance with the defined PF-PNF/PM task sharing (i.e., task sharing for hand flying vs. autopilot operation, or task sharing for normal condition vs. abnormal/emergency condition).

Nevertheless, if a standard call is omitted by one pilot, the other pilot should suggest the call, per CRM.

The absence of a standard call at the appropriate time or the absence of an acknowledgment may be the result of a system malfunction or equipment malfunction, or possible incapacitation of the other crewmember.

Standard calls should be used to:

- Give a command (delegate a task) or transfer information;
- Acknowledge a command or confirm receipt of information;
- Give a response or ask a question (feedback);
- Call a change of indication (e.g., a flight-mode annunciator [FMA] mode change); or,
- Identify a specific event (e.g., crossing an altitude or flight level).

Several major airlines have established an operating philosophy know as the *silent cockpit* which holds for noncritical as well as critical phases of flight. In the silent cockpit, all FMA changes (e.g., through mode selections, transitions and reversion) and other changes in flight deck displays and indications are announced by either the PF or PNF/PM *only if they differ from expectations or are abnormal*. The silent cockpit concept encourages a constant and thorough instrument scan by both flight crewmembers *without any verbal exchange* except as defined above.

General Standard Calls

The following are standard calls:

- "Check" (or "verify"): A command for the other pilot to check an item or to verify an item;
- "Checked": A confirmation that an item has been checked;
- "Cross-check(ed)": A confirmation that information has been checked at both pilot stations;
- "Set": A command for the other pilot to enter a target value or a configuration;
- "Arm": A command for the other pilot to arm a system (or a mode);
- "Engage": A command for the other pilot to engage a system or select a mode; and,
- "On" (or "off") following the name of a system: A command for the other pilot to select (or deselect) the system; or a response confirming the status of the system.

Specific Standard Calls

Specific standard calls should be defined for the following events:

- Flight crew/ground personnel communication;
- Engine-start sequence;
- Landing gear and slats/flaps selection (retraction or extension);
- Initiation, interruption, resumption and completion of normal checklists;
- Initiation, sequencing, interruption, resumption and completion of abnormal checklists and emergency checklists;
- FMA mode changes;
- Changing the altimeter setting;
- Approaching the cleared altitude or flight level;
- Traffic-alert and collision avoidance system (TCAS) traffic advisory (TA) or resolution advisory (RA);
- PF-PNF/PM transfer of control;
- Excessive deviation from a flight parameter;
- Specific points along the instrument approach procedure;
- Approaching minimums and reaching minimums;
- Acquisition of visual references; and,
- Decision to land or to go around.

The use of standard calls is of paramount importance for the optimum use of automation (autopilot, flight director and autothrottle mode arming or mode selection, target entries, FMA annunciations, flight management system [FMS] mode selections):

- Standard calls should trigger immediately the question "What do I want to fly now?" and thus clearly indicate which:
  - Mode the pilot intends to arm or select; or,
  - Target the pilot intends to enter; and,
- When the intention of the PF is clearly transmitted to the PNF/PM, the standard calls also will:
  - Facilitate cross-check of the FMA (and primary flight display or navigation display, as applicable); and,
  - Facilitate crew coordination, cross-check and backup.

Standard calls also should be defined for flight crew/cabin crew communication in both:

- Normal conditions; and,
- Abnormal conditions or emergency conditions (e.g., cabin depressurization, on-ground emergency/evacuation, forced landing or ditching, crewmember incapacitation).

Harmonization of Standard Calls

The harmonization of standard calls across various aircraft fleets (from the same aircraft manufacturer or from different aircraft manufacturers) is desirable but should not be an overriding demand.

Standard calls across fleets are essential only for crewmembers operating different fleets (i.e., communication between flight deck and cabin or flight deck and ground).

Within the flight deck, pilots must use standard calls appropriate for the flight deck and systems.

With the exception of aircraft models with flight deck commonality, flight deck layouts and systems are not the same; thus, similarities as well as differences should be recognized.

When defining standard calls, standardization and operational efficiency should be balanced carefully.

Summary

Standard calls are a powerful tool for effective crew interaction and communication.

The command and the response are of equal importance to ensure timely action or correction.

The following FSF ALAR Briefing Notes provide information to supplement this discussion:

- 1.1 — Operating Philosophy;
- 1.2 — Automation;
- 1.5 — Normal Checklists;
- 2.3 — Pilot-Controller Communication; and,
- 2.4 — Interruptions/Distractions.

Notes

1. Flight Safety Foundation. "Killers in Aviation: FSF Task Force Presents Facts About Approach-and-landing and Controlled-flight-into-terrain Accidents." *Flight Safety Digest* Volume 17 (November–December 1998) and Volume 18 (January–February 1999): 1–121. The facts presented by the FSF ALAR Task Force were based on analyses of 287 fatal approach-and-landing accidents (ALAs) that occurred in 1980 through 1996 involving turbine aircraft weighing more than 12,500 pounds/5,700 kilograms, detailed studies of 76 ALAs and serious incidents in 1984 through 1997 and audits of about 3,300 flights.
2. The Flight Safety Foundation Approach-and-landing Accident Reduction (ALAR) Task Force defines *causal factor* as "an event or item judged to be directly instrumental in the causal chain of events leading to the accident [or incident]." Each accident and incident in the study sample involved several causal factors.

Related Reading From FSF Publications

Loukopoulos, Loukia D.; Dismukes, R. Key; Barshi, Immanuel. "The Perils of Multitasking." *AeroSafety World* Volume 4 (August 2009).

Voss, William R. "Automation Expectations." *AeroSafety World* Volume 4 (July 2009).

Lacagnina, Mark. "Too Long at the Wheel." *AeroSafety World* Volume 4 (March 2009).

Dean, Alan; Pruchnicki, Shawn. "Deadly Omissions." *AeroSafety World* Volume 3 (December 2008).

Lacagnina, Mark. "Close Call in Khartoum." *AeroSafety World* Volume 3 (March 2008).

Lacagnina, Mark. "High, Hot and Fixated." *AeroSafety World* Volume 3 (January 2008).

Gurney, Dan. "Last Line of Defense." *AeroSafety World* Volume 2 (January 2007).

Flight Safety Foundation (FSF) Editorial Staff. "Boeing 767 Strikes Mountain During Circling Approach." *Accident Prevention* Volume 62 (December 2005).

FSF Editorial Staff. "Sabreliner Strikes Mountain Ridge During Night Visual Approach." *Accident Prevention* Volume 60 (April 2003).

FSF Editorial Staff. "Nonadherence to Standard Procedures Cited in Airbus A320 CFIT in Bahrain." *Accident Prevention* Volume 59 (December 2002).

FSF Editorial Staff. "Cargo Airplane Strikes Frozen Sea During Approach in Whiteout Conditions." *Accident Prevention* Volume 59 (January 2002).

FSF Editorial Staff. "Runway Overrun Occurs After Captain Cancels Go-around." *Accident Prevention* Volume 58 (June 2001).

Rosenthal, Loren J.; Chamberlin, Roy W.; Matchette, Robert D. "Flight Deck Confusion Cited in Many Aviation Incident Reports." *Human Factors & Aviation Medicine* Volume 41 (July–August 1994).

FSF Editorial Staff. "Cockpit Coordination, Training Issues Pivotal in Fatal Approach-to-Landing Accident." *Accident Prevention* Volume 54 (January 1994).

Notice

The Flight Safety Foundation (FSF) Approach-and-Landing Accident Reduction (ALAR) Task Force produced this briefing note to help prevent approach-and-landing accidents, including those involving controlled flight into terrain. The briefing note is based on the task force's data-driven conclusions and recommendations, as well as data from the U.S. Commercial Aviation Safety Team's Joint Safety Analysis Team and the European Joint Aviation Authorities Safety Strategy Initiative.

This briefing note is one of 33 briefing notes that comprise a fundamental part of the FSF *ALAR Tool Kit,* which includes a variety of other safety products that also have been developed to help prevent approach-and-landing accidents.

The briefing notes have been prepared primarily for operators and pilots of turbine-powered airplanes with underwing-mounted engines, but they can be adapted for those who operate airplanes with fuselage-mounted turbine engines, turboprop power plants or piston engines. The briefing notes also address operations with the following: electronic flight instrument systems; integrated autopilots, flight directors and autothrottle systems; flight management systems; automatic ground spoilers; autobrakes; thrust reversers; manufacturers'/operators' standard operating procedures; and, two-person flight crews.

This information is not intended to supersede operators' or manufacturers' policies, practices or requirements, and is not intended to supersede government regulations.

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