International Civil Aviation Organization

Regional Aviation Safety Group - Middle East

Fourth Meeting (RASG-MID/4)
(Jeddah, Saudi Arabia, 30 March - 1 April 2015)

Agenda Item 3: Regional Performance Framework for Safety

UPDATE ON DEVELOPMENT & IMPLEMENTATION OF SEIs & DIPs RELATED TO LOC-I

(Presented by LOC-I Coordinator)

SUMMARY

This paper provides updates on the development and implementation of Safety Enhancement Initiative (SEI) and presents the Detailed Implementation Plans (DIPs) to mitigate risks of LOC-I. The paper highlights in particular the progress achieved to address LOC-I/1 DIP related to Airplane State Awareness –Low speed alerting.

Action by the meeting is at paragraph 3.

REFERENCES

- MID States Airlines & Fleet Tracking Sheet
- RAST-MID/LOC-1/1,/2,/3

1. INTRODUCTION

1.1 Loss of Control In-flight was identified as a high risk category for MID Region to be addressed within the framework of RASG-MID due to its high non-survivability.

1.2 The RASG-MID Steering Committee (RSC/3) meeting reviewed a revised set of SEIs and DIPs which were developed by LOC/I coordinator based on the outcome of LOC-I symposium and the latest developments of ICAO related SARPs and guidance material and agreed to include the initiatives presented during the meeting in the revised DIPs.

2. DISCUSSION

2.1 To help the Airline Industry in implementing existing best practices in pilot training and in raising industry awareness. IATA in collaboration with the industry has developed a LOC-I tool kit.

2.2 The toolkit will collate existing guidance material and best practices regarding Loss of Control training and prevention. It will assemble, in a single publication, a set of documents, analysis, recommended best practices, example case studies, policies and procedures recommended by the Industry for the operators.

2.3 IATA MENA and Boeing Co. will organize a Seminar to promote and roll out the LOC-I Tool Kit (LOC-I/3 output 1). The tentative date of the Seminar will be Fourth Quarter 2015- First Quarter 2016.

2.4 Revised DIPs along with SEIs that reflect the RSC/3 suggestions are at **Appendix A**.

2.5 One of the precursors for Loss of Control – In-flight was identified as low airspeed alert (LOC-I/1) refers. "Low airspeed alerting" activities were launched further to the Commercial Aviation Safety Team (CAST) Aircraft State Awareness (ASA) studies.

2.6 The purpose of flight crew alerts on airplanes is to attract the attention of the Flight crew and to inform them of specific abnormal airplane system conditions or certain abnormal operational events that require their awareness, and, in modern alerting systems, to advise them of possible actions to address these conditions.

2.7 To help avoid loss of control, the manufacturers have developed and implemented on new generation airplanes a flight envelope protection system that alerts flight crews when airplane reaches its minimum maneuvering speed.

2.8 To gauge the status of MID operators, IATA consulted with manufacturers of Boeing, Airbus, and Embraer aircraft to determine the status of their fleet with regards to low airspeed alert. The results are at **Appendix B**.

2.9 IATA compiled preliminary statistical data from different sources to identify the number of operators and their fleet in MID Region. The table at **Appendix C** outlines the breakdown of the airlines and the number of aircraft in Middle East based carriers including the non-IATA members. The table shows that there are **1471** aircraft registered in the MID Region of which:

- **949** New Generation aircraft with glass cockpit having the provision of low speed alert. This figure represents **64% compliance** rate.
- **207 Classic western built aircraft** representing **15 %** of the total fleet in MID Region.
- **123** Regional Jets representing **8%.**
- **124** Eastern built aircraft representing **8%**, mainly in Iran, Libya and Sudan.
- **68** Turbo Prop aircraft representing **5 %**.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and endorse the SEIs and DIPs related to LOC-I at **Appendix A**;

b) request States' assistance to review and verify the registered operators and their fleet provided in **Appendix C**; and

c) agree on next course of action to address the classical and eastern built aircraft where technical solution is not available.

APPENDIX A

Detailed Implementation Plan Template

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-MID/LOC-I/1	Airplane State awareness (ASA)- Low airspeed alerting	Safety Management Standarzation: Implementation of risk-based standarization Safety Oversight Standarization: Promotion of Compliance with National Regulations and Adoption of Industry Best Practices	BP-GEN-1 BP-GEN-2 BP-GEN-4 BP-STD-S-12 BP-STD-S-13	High	Moderate	P2	1	Medium term

Safety Enhancement Action (expanded)	Air carriers implement low airspeed alerting on existing transport category airplane (TCA) type designs as practical and feasible.
Statement of Work	A CAST study of 18 loss-of-control accidents and incidents determined that low energy state and stall, resulting from flight crew loss of airplane state awareness (ASA), played a role in 8 events. To further improve early flight crew awareness of a decreasing energy state throughout the MID region fleet, air carriers should implement existing manufacturer service bulletins to provide low airspeed alerting on existing transport category type designs as applicable.
Champion Organization	IATA
Human Resources	IATA, Pilot Associations, Safety, Flight Operations and Training managers, aircraft manufacturers.
Financial Resources	

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
Relation with Current Aviation Community Initiative		□ Federal Aviation Administration (FAA) Title 14, Code of Federal Regulations (14 CFR) § 25.1322, Amendment 25-131 □ FAA Advisory Circular (AC) 25.1322-1, Flight Crew Alerting □ FAA 14 CFR § 25.1322, Amendment 25-119 □ FAA AC 25.1329-1B, Approval of Flight Guidance Systems						
Performance Goal		Estimated Risk Reduction The estimated risk reduction will assume that 50% of MID States-registered airplanes used in part commercial operations and not currently equipped with low airspeed alerting would be modified to include low airspeed alerting by this safety enhancement (SE). Implementation Implementation will be assessed through MID/RAST Tracking Process Effectiveness Effectiveness will be assessed by monitoring the following metrics: □ Flight Operational Quality Assurance (FOQA) metrics show a reduction in incidents of stall warnings resulting from speed decays						
Indicators		Reduce MID average LOC-I accident rate to be below the global average rate by end of 2016						
Key Milestones (Deliverables)		Flow time (mo) Start Date End Date Output 1: 24 9/30/2014 9/29/2016 Completion:						
Potential Blockers		Financial						
DIP Notes		Supporting CAST Intervention Strategies IS 1233 – To improve flight crew awareness of low airspeed, manufacturers should develop and regulators should ensure implementation of systems that alert flight crews when the airplane reaches its minimum maneuvering speed (i.e., "top of amber band") on airplanes with no (or with overrideable) flight envelope protection, iaw 25.1322 at amdt 25-131. In order to improve early flight crew awareness of a decreasing energy state, manufacturers should develop and implement multisensory low airspeed alerting at the caution level (see 14 CFR § 25.1322, amdt 25-131) in existing airplanes, as practical and feasible. The intent of this SE is for operators to incorporate existing service bulletins from manufacturers that provide this functionality.						

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
Output		Air carriers implement existing and available manufacturer service bulletins to install low airspeed alerting functionality in their existing airplanes, as applicable.						
Actions		1.IATA will consult with all RASG-MID-represented manufacturers to determine what service bulletins are currently approved and available to install low airspeed alerting functionality in existing type designs, 2. IATA will communicate with their air carrier members, explaining the Airplane State Awareness (ASA) analysis and the role of low energy state and stall in contributing to the accidents, and encourage them to install existing service bulletins from manufacturers that address this issue in their airplanes at their earliest convenience. 3. Air operators will review the available service bulletins, determine applicability of the available bulletins to their specific fleets, and develop an implementation plan for prioritizing incorporation of these bulletins at their earliest convenience. 4. Air carrier actions are considered when all applicable airplanes in their fleet have the available service bulletins installed. 5. IATA will track implementation of their member carriers and report progress to MID/RAST.						
Output notes		Applicability Air carriers that operate airplanes for which multisensory low airspeed alerting is available for incorporation via service bulletin. Most production airplanes already incorporate some form of multisensory low airspeed alerting. The specific reduction in risk from this output assumes about 1000 additional airplanes install the feature. 6 months for IATA to consult with manufacturers 6 months after receiving available service bulletins from theManufacturers for IATA to communicate with their air carrier members 12 months from receiving list of available service bulletins from industry associations for air carriers to implement service bulletins						
Target completion date		9/29/2016						

Detailed Implementation Plan Template

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-MID/LOC-I/2	Standard Operating Procedures Effectiveness and Adherence	Safety Management Standarzation: Implementation of risk-based standarization Safety Oversight Standarization: Promotion of Compliance with National Regulations and Adoption of Industry Best Practices	BP-GEN-1 BP-GEN-2 BP-GEN-4 BP-STD-S-12 BP-STD-S-13 CAST SEI 194	High	Moderate	P2	2	Long Term

Safety Enhancement Action (expanded)	Air carriers develop and implement improved standard operating procedures (SOPs) to reduce flight crew member loss of airplane state awareness.
Statement of Work	In a CAST study of 18 loss-of-control accidents and incidents, insufficient adherence to SOPs was a factor in 15 events. To improve flight crew adherence to SOPs and reduce the risk of lost awareness of airplane state, air carriers should: 1. Review, and update as needed, current SOPs for consistency with the CAST Plan, manufacturer recommendations, and air traffic control (ATC) procedures; 2. Assess level of adherence to current SOPs, identifying possible reasons for insufficient adherence to certain procedures; 3. Develop training programs to provide pilots with rationale for SOPs, focusing on those with lower adherence rates.
Champion Organization	IATA
Human Resources	IATA, Pilot Associations, Safety, Flight Operations and Training managers, aircraft manufacturers.
Financial Resources	

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
Relation with Current Aviation Community Initiative								
Performance Goal								
Indicators								
Key Milestones (Deliverables)								
Potential Blockers								

- Federal Aviation Administration (FAA) Advisory Circular (AC) 120-71A, Standard Operating Procedures for Flight Deck Crewmembers
- CAST Plan (located on Skybrary: http://www.skybrary.aero/index.php/Portal:CAST_SE_Plan)
- CAST Safety Enhancement (SE) 2 – CFIT – Standard Operating Procedures
- CAST SE 26 – LOC - Policies and Procedures - Standard Operating Procedures (SOP's)
- FAA Order 7110.65, Air Traffic Control

Estimated Risk Reduction

Implementation
Implementation will be assessed through MID/RAST Tracking Process.
Effectiveness
Effectiveness will be assessed by monitoring the following:
- Narrative pilot reports (e.g.,Aviation Safety Reporting System (ASRS)) indicate a reduction in incidents that indicate flight crew confusion over – or intentional disregard of – operator SOPs.

Reduce MID average LOC-I accident rate to be below the global average rate by end of 2016

Flow time	(mo)	Start Date	End Date
Output 1:	12	1/31/2015	1/31/2016
Output 2:	14	1/31/2016 (end OP1)	3/31/2017
Output 3:	20	3/31/2017 (end OP2)	11/30/2018
Completion:	**44**	**1/30/2015**	**11/30/2018**

Financial

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
DIP Notes		Supporting CAST Intervention Strategies IS 110 - Airlines/operators and regulators should ensure that their training/standardization and monitoring programs emphasize the importance of adherence to standard operating procedures and identify the rationale behind those procedures. IS 157 - Airlines/operators, regulators, air traffic service providers should establish policies or programs to address rushed approaches, including elimination of rushed approaches, recognition and rejection of rushed approaches and training for those encountered. IS 556 - To reduce pilot overload, airlines/operators should develop standard operating procedures to help standardize the use of the appropriate level of automation for the operation and the airplane design. IS 40 - Airlines/operators and air traffic service providers should ensure fluency/proficiency in the use of basic English language. IS 56 - Airlines/operators should implement Flight Operations Quality Assurance (FOQA) programs to identify systemic procedural deviations and unsafe trends						
Output 1		Air carrier standard operating procedures (SOP) reviewed, and updated as needed, for consistency with the Commercial Aviation Safety Team (CAST) Plan, manufacturer recommendations, and air traffic control (ATC) procedures.						
Champion Organization		IATA						
Supporting Organizations		Air carriers Airbus Bombardier, Inc. Embraer National Air Carrier Association (NACA) Regional Airline Association (RAA) The Boeing Company						

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
Actions		1. IATA will communicate with their air carrier members, explaining the analysis undertaken by CAST regarding loss of airplane state awareness, the role of that non-adherence to SOPs played in the accidents, and the purpose of the CAST safety enhancement (SE). 2. Air carriers will review SOPs for consistency with the CAST Plan, focusing on completeness for all phases of flight and improved awareness and response during operations that are more prone to reduced airplane state awareness (i.e., rushed and/or unstabilized approaches, go-arounds, transfer of control, automation interaction, and pilot flying/pilot monitoring duties). 3. Air carriers will consult with manufacturers to check that SOPs are consistent with current manufacturer recommendations. 4. Air carriers will review SOPs for compatibility with the most current ATC procedures, paying attention to airports where data show higher rates of unstabilized approach or excessive bank angles. 5. Air carriers will validate and update SOPs as needed based on above review, ensuring that procedures are clear, logical, prioritized, and incorporate human factors best practices. 6. Air carriers will prioritize SOPs for monitoring and evaluation based on relevance to the issues of airplane state awareness (ASA), as identified in the CAST report. 7. Air carrier actions are complete for this output when the following are accomplished: a) The air carrier has reviewed existing SOPs for consistency with the latest versions of the CAST plan, manufacturer recommendations, and ATC procedures b) The air carrier has updated SOPs as necessary 8. IATA will track implementation of their member carriers and report progress to MID/RAST.					
Output notes		The CAST plan can be found on Skybrary at: http://www.skybrary.aero/index.php/Portal:CAST_SE_Plan) ATC procedures can be found in the most recent version of FAA Order 7110.65, Air Traffic Control.						
Target completion date		1/31/2016						
Output 2		Assessments by air carriers to determine the level of adherence to current standard operating procedures (SOP), identifying possible reasons for insufficient adherence.						

Detailed Implementation Plan Template

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
RAST-MID/LOC-I/3	ASA – Training – Flight Crew Training Verification and Validation	Safety Management Standarzation: Implementation of risk-based standarization Safety Oversight Standarization: Promotion of Compliance with National Regulations and Adoption of Industry Best Practices	BP-GEN-1 BP-GEN-2 BP-GEN-4 BP-STD-S-12 BP-STD-S-13 CAST SEI 195	High	Moderate	P2	3	Long Term

Safety Enhancement Action (expanded)	Air carriers verify and validate the quality of training provided to aircrews, with emphasis on externally provided training.
Statement of Work	A CAST study of 18 loss-of-control accidents and incidents concluded that in several of the events the flight crew did not respond to situations in accordance with how they had been trained. In some of these events, a review of the accident report indicated proficiency issues with pilot even after checking and qualification, particularly when training had been provided by an external training organization. To improve flight crew proficiency in handling issues that can lead to loss of airplane state awareness, air carriers should verify and validate the quality and consistency of training, with emphasis on externally provided training. This should include examining both the content and conduct of training. Training verification and validation should include improving surveillance of and communication with third-party training providers.
Champion Organization	IATA
Human Resources	IATA, Pilot Associations, Safety, Flight Operations and Training managers, aircraft manufacturers.
Financial Resources	

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
Relation with Current Aviation Community Initiative		Related Federal Aviation Administration (FAA) Guidance and Policy □ FAA Information for Operators InFO 13003, Contract Instructor and Contract Check Airman Initial Training Program Records □ FAA Order 8900.1 Vol 3 Ch 54, Sec 5, para 3-4413A regarding part 142 training centers						
Performance Goal		Estimated Risk Reduction Implementation Implementation will be assessed through MID/RAST Tracking Process Effectiveness Effectiveness will be assessed by monitoring the following metrics: □ Narrative pilot reports (e.g., Aviation Safety Action Program (ASAP) or Aviation Safety Reporting System (ASRS) show a reduction in incidents where training was not followed or understood during situations related to loss of airplane state awareness.						
Indicators		Reduce MID average LOC-I accident rate to be below the global average rate by end of 2016						
Key Milestones (Deliverables)		Flow time (mo) Start Date End Date Out put 1: 15 3/30/2015 6/30/2016 Out put 2: 42 1/31/2015 7/31/2018						
Potential Blockers								
DIP Notes		Supporting CAST Intervention Strategies IS 218 - To enhance contractor training, airlines/operators should conduct/improve surveillance of contractor training programs for adequacy of training. IS 1215 - To ensure aircrew proficiency, airlines/operators should ensure that their training/standardization programs include verification and validation (e.g., testing and check flights prior to first revenue flight) that the training was effective.						
output 1		IATA will organize a seminar to promote and roll-out LOC-I tool kit						

No	Safety Enhancement Action	GASP Safety Initiative (ICAO Doc 10004)	Best Practices Supporting GASP Safety Initiative (ICAO Doc 10004, Appendix 2)	Safety Impact	Changeability	Indicator	Priority	Time Frame
Output 2		Air carrier standard operating procedures (SOP) reviewed, and updated as needed, for consistency with the Commercial Aviation Safety Team (CAST) Plan, manufacturer recommendations, and air traffic control (ATC) procedures.						
Champion Organization		IATA						
Supporting Organizations		Air carriers						
Actions		1.IATA will organzie a seminar to promote and roll out the new LOC-I tool kit 2.IATA will communicate with their air carrier members, explaining the analysis undertaken by CAST regarding loss of airplane state awareness, the role of ineffective training, and the purpose of the CAST safety enhancement (SE). 3. Air carriers will implement a process to ensure their aircrew training program, including any externally provided training, is consistent with current airline and manufacturer policy and procedures. 4 Air carriers will implement a process to validate the qualification and currency of trainers, including third-party training providers 5. Air carriers will validate contractor training by periodically observing training and/or checking events and auditing records to ensure consistency of aircrew training and pilot proficiency. 6. Air carrier actions are considered complete for this output when the following are accomplished: a) The air carrier has completed review of their training b) The air carrier has implemented processes to assess trainer currency and qualification c) The air carrier has made an initial observation / validation visit to any third-party training organizations they use, as applicable 7.IATA will track implementation of their member carriers, and report progress and completion to MID/RAST.						
Output notes								
Target completion date		7/31/2018						

APPENDIX B

Status of Low Airspeed Alerting Provisions

Boeing Fleet:

- Low airspeed alerting is basic on the **787, 777, 747-8, 767-400 {**with the Large Format Display Systems (LFDS**)} and 747-400.**
- It is an option on the **737-600/700/800/900** and there is a service bulletin available (SB 737-34A2292).It adds an aural Caution ("AIRSPEED LOW") from EGPWS to the amber visual indications (box around airspeed flashes amber) on the Primary Flight Display (PFD).
- It is not basic, not an option, and no service bulletin is available for the **757, 727, MD-90, MD-80, 737-100/200/300/400/500 or the 767** (with the exceptions noted above).

Airbus Fleet:

- Low airspeed alerting is basic on the Fly by Wire aircraft (**A320 family, A330, A340, A350 and A380**). The Flight Envelop Protections implemented in these aircraft have been judged as compliant with the new requirements. Furthermore, these aircraft are already fitted with a "Speed, Speed, Speed" aural alert based on the energy of the aircraft.
- It is not basic on Non Fly by Wire aircraft (**A300 & A310**). The discussions with the FAA are ongoing to determine if the current design of these aircraft (in particular the aircraft with alpha-floor function capability) is compliant with the new requirements.

Embraer Fleet

- EMBRAER 170/175/190/195:
  - No Low Speed Alert available, either factory-original or via SB.
  - Stall protection is provided first by a stick shaker, and then by alpha protection (through fly-by-wire system), both based on angle-of-attack and not purely airspeed. These features are factory-original and equip all aircraft delivered.
- ERJ 135/140/145:
  - No Low Speed Alert available, either factory-original or via SB.
  - Stall protection is provided first by a stick shaker, and then by a stick pusher, both based on angle-of-attack and not purely airspeed. These features are factory-original and equip all aircraft delivered.

Bombardier Fleet, ATR Fleet, Eastern Built Aircraft

- No data available.

MID States Airlines Fleet

COUNTRY	Company	ICAO	IATA	Airbus A300-600 H	Airbus A300B2/B4 H	Airbus A310 H	Airbus A318 M	Airbus A319 M	Airbus A320 M	Airbus A321 M	Airbus A330 H	Airbus A340 H	Airbus A380 H	Antonov An-12 M	Antonov An-124 H	Antonov An-140 M	Antonov An-24 M	Antonov An-26 M	Antonov An-30 M	Antonov An-32 M	Antonov An-72 M	Antonov An-74 M	ATR ATR 42 M	ATR ATR 72 M	Avro RJ Avroliner M	BAE SYSTEMS (HS) 146 M	Boeing (McDonnell-Douglas) DC-9 M	Boeing (McDonnell-Douglas) MD-11 H	Boeing (McDonnell-Douglas) MD-80 M	Boeing (McDonnell-Douglas) MD-90 M	Boeing 707 M/H	Boeing 727 M	Boeing 737 (CFMI) M	Boeing 737 (JT8D) M	Boeing 737 (NG) M	Boeing 747 Classic H	Boeing 747-400 H	Boeing 747-8 H	Boeing 757 M	Boeing 767 H	Boeing 777 H	Boeing 787 H	Bombardier (Canadair) CRJ Regional Jet M	Bombardier (Canadair) CRJ700 Regional Jet M	Bombardier (Canadair) CRJ900 Regional Jet M	Bombardier (DHC) Dash 7 M	Bombardier (DHC) Dash 8-100/200 M	Bombardier (DHC) Dash 8-300 M	Bombardier (DHC) Dash 8-400 M	CAIC MA60 M	Embraer 170 M	Embraer 175 M	Embraer 190 M	Embraer 195 M	Embraer ERJ-135 M	Embraer ERJ-145 M	Fokker 100 M	Fokker 50 M	Fokker 70 M	Fokker F_28 M	Ilyushin Il-62 H	Ilyushin Il-76 H	Ilyushin Il-86 H	Jetstream Jetstream 31 M	Lockheed Hercules M	Lockheed L-1011 TriStar H	Tupolev Tu-134 M	Tupolev Tu-154 M	Tupolev Tu-204 M	Yakovlev Yak-40 M	Yakovlev Yak-42 M	Total
Bahrain	DHL International Aviation EEMEA	DHX	ES																																					3																																				3
Bahrain	Gulf Air	GFA	GF						16	4	7	3																																																														30
Bahrain	Mena Aerospace	MEN																															1																						1																2
Egypt	Alexandria Airlines	KHH																															2																																						2
Egypt	Almasria Universal Airlines	LMU	UJ						1	1																																																																2
Egypt	Air Cairo	MSC	SM						4																																																																		4
Egypt	Egyptair	MSR	MS	2	1				13	4	11	1																							2		21						10										12																								77
Egypt	Nile Air	NIA	NP						2																																																																		2
Egypt	Nesma Airlines	NMA	NM						3																																																																		3
Egypt	AMC Airlines	AMV	YJ																																	1																																					1
Egypt	Cairo Aviation	CCE																																																																			4			4
Egypt	Air Memphis	MHS	M1						0																		1		1																																											2
Egypt	Midwest Airlines (Egypt)	MWA																																		0																																					0
Egypt	Air Arabia Egypt	RBG	E5						1																																																																		1
Egypt	Tristar Air	TSY			1																																																																					1
Egypt	Petroleum Air Services																																												1	4		5																									10
Iran	Iran Aseman Airlines	IRC	EP									1													6								5																													14																	26
Iran	Kish Air	IRK	Y9																										7																													3											1				11
Iran	Caspian Airlines	CPN	RV																										4																																								4				8
Iran	Iran Air	IRA	IR	4	10	4			6																											7																					14																	45
Iran	Iran Airtours	IRB	B9																										3																																								8				11
Iran	Iranian Naft Airlines	IRG																																																							4	6															10
Iran	Mahan Air	IRM	W5	14	4	10						2														6	11																																																47
Iran	Payam Air	IRP																																																																						0
Iran	Qeshm Airlines	IRQ		5																					1																																4	4															14
Iran	Safat Airlines	IRV																2																																																							2
Iran	Eram Air	IRY																																																																		1				1
Iran	Saha Air	IRZ																													3																																										3
Iran	Zagros Airlines	IZG	ZV																										9																																												9
Iran	Yas Air	MHD																				2																																																			2
Iran	Pouya Air	PYA																																																												2											2
Iran	Fars Qeshm Air Lines	QFZ	QE																																																																				2	2
Iran	Taftan Air	SBT																																																								1														1
Iran	HESA - Persian Gulf Airlines	SPN														6																																																									6
Iran	Taban Air	TBM	HH																										4																																							1				5
Iran	ATA Air	TBZ	I3						3																				6																																												9
Iran	Atrak Air								2																																																																		2
Iraq	Zagrosjet	GZQ	Z4							1																																																																	1
Iraq	Iraqi Airways	IAW	IA						3	2	1																								3	4		2			2	1				6																														24
Iraq	AlNaser Airlines	MHK	6N																														1							1																						1											3
Jordan	Jordan Aviation	JAV	R5			2			2		1																						6							3																																		14
Jordan	Royal Jordanian	RJA	RJ			2		4	5	4	2	0																														5										3		5																			30
Jordan	Jordan International Air Cargo	JCI	J4																																																													3											3
Jordan	Petra Airlines	PTR							1																																																																		1
Jordan	Royal Falcon Airlines	RFJ	RL						1																								1																																						2
Jordan	Royal Wings	RYW	RY						1																																																																		1

COUNTRY	Company	ICAO	IATA	Airbus A300-600 H	Airbus A300B2/B4 H	Airbus A310 H	Airbus A318 M	Airbus A319 M	Airbus A320 M	Airbus A321 M	Airbus A330 H	Airbus A340 H	Airbus A380 H	Antonov An-12 M	Antonov An-124 H	Antonov An-140 M	Antonov An-24 M	Antonov An-26 M	Antonov An-30 M	Antonov An-32 M	Antonov An-72 M	Antonov An-74 M	ATR ATR 42 M	ATR ATR 72 M	Avro RJ Avroliner M	BAE SYSTEMS (HS) 146 M
Jordan	Barq Aviation																									
Jordan	Elite Aviation																									
Jordan	Privilege Jet Airlines																									
Kuwait	Jazeera Airways	JZR	J9						9																	
Kuwait	Kuwait Airways	KAC	KU	5		3			3			4														
Kuwait	Gryphon Airlines	VOS	6P																							
Kuwait	LoadAir Cargo																									
Lebanon	Middle East Airlines	MEA	ME						11	4	4															
Lebanon	TMA	TMA		1																						
Lebanon	Wings of Lebanon	WLB																								
Libya	Afriqiyah Airways	AAW	8U					3	8		3															
Libya	Libyan Airlines	LAA	LN	1					7		2												2			
Libya	Buraq Air	BRQ	UZ																							
Libya	Global Air	GAK	5S																							
Libya	Ghadames Air Transport	GHT	0G						1																	
Libya	Air Kufra	KAV																								
Libya	Libo Air Cargo	LBO	6W																		1					
Libya	Libyan Air Cargo	LCR													2			11		3	2					
Libya	Air Libya	TLR																							2	2
Oman	Oman Air	OMA	WY								7												2			
Qatar	Qatar Airways	QTR	QR	3				2	32	12	30	4	4													
Republic of Yemen	Yemenia	IYE	IY			3			2		2															
Republic of Yemen	Felix Airways	FXX	F0																							
Republic of Yemen	Barash Aviation																									
Saudi Arabia	Saudia	SVA	SV						35	15	11															
Saudi Arabia	nasair	KNE	XY				2		20																	
Saudi Arabia	SNAS Aviation	RSE																								
Sudan	Sudan Airways	SUD	SD	2		1			1																	
Sudan	Alfa Airlines	AAJ															1	2								
Sudan	Badr Airlines	BDR	J4																			2				
Sudan	Blue Bird Aviation (Sudan)	BLB																								
Sudan	El Dinder Aviation	DND																								
Sudan	Dove Air Services	DOV																1								
Sudan	Feeder Airlines	FDD																								
Sudan	Kata Transportation Company	KTV											1				1									
Sudan	Alok Air	LOK																								
Sudan	El Magal Aviation	MGG											1				1									
Sudan	Almajara Aviation	MJA																								
Sudan	Marsland	MSL	M7														1									
Sudan	Nova Airways	NOV	O9																							
Sudan	Mid Airlines	NYL																								
Sudan	Sun Air	SNR														1										
Sudan	Tarco Air	TRQ																	1							
Sudan	Aviatrans	VTT															1									
Sudan	Air West Cargo																									
Sudan	Ben Air																2									
Sudan	Green Flag Aviation												1				1	1			2					
Sudan	Kush Aviation												1				1									
Syria	Syrianair	SYR	RB						6															2		
United Arab Emirates	Air Arabia	ABY	G9						31																	
United Arab Emirates	Etihad Airways	ETD	EY					2	28		34	11	1													
United Arab Emirates	Emirates Airline	UAE	EK					1			23	12	57													

COUNTRY	Company	Boeing (McDonnell-Douglas) DC-9 M	Boeing (McDonnell-Douglas) MD-11 H	Boeing (McDonnell-Douglas) MD-80 M	Boeing (McDonnell-Douglas) MD-90 M	Boeing 707 M/H	Boeing 727 M	Boeing 737 (CFMI) M	Boeing 737 (JT8D) M	Boeing 737 (NG) M	Boeing 747 Classic H	Boeing 747-400 H	Boeing 747-8 H	Boeing 757 M	Boeing 767 H	Boeing 777 H	Boeing 787 H	Bombardier (Canadair) CRJ Regional Jet M	Bombardier (Canadair) CRJ700 Regional Jet M	Bombardier (Canadair) CRJ900 Regional Jet M	Bombardier (DHC) Dash 7 M	Bombardier (DHC) Dash 8-100/200 M	Bombardier (DHC) Dash 8-300 M	Bombardier (DHC) Dash 8-400 M
Jordan	Barq Aviation																							
Jordan	Elite Aviation																							
Jordan	Privilege Jet Airlines																							
Kuwait	Jazeera Airways																							
Kuwait	Kuwait Airways											1				2								
Kuwait	Gryphon Airlines								2															
Kuwait	LoadAir Cargo											0												
Lebanon	Middle East Airlines																							
Lebanon	TMA																							
Lebanon	Wings of Lebanon							0																
Libya	Afriqiyah Airways																							
Libya	Libyan Airlines																			8				
Libya	Buraq Air							3		2														
Libya	Global Air																							
Libya	Ghadames Air Transport	2																						
Libya	Air Kufra																							
Libya	Libo Air Cargo																							
Libya	Libyan Air Cargo																							
Libya	Air Libya						2		1															
Oman	Oman Air									15														
Qatar	Qatar Airways															39	18							
Republic of Yemen	Yemenia						1															3		
Republic of Yemen	Felix Airways																	2	2					
Republic of Yemen	Barash Aviation																							
Saudi Arabia	Saudia		4		3						9	4	2			33								
Saudi Arabia	nasair									2														
Saudi Arabia	SNAS Aviation						3																	
Sudan	Sudan Airways																							
Sudan	Alfa Airlines																							
Sudan	Badr Airlines																							
Sudan	Blue Bird Aviation (Sudan)																							
Sudan	El Dinder Aviation																							
Sudan	Dove Air Services																							
Sudan	Feeder Airlines																							
Sudan	Kata Transportation Company																							
Sudan	Alok Air																							
Sudan	El Magal Aviation																							
Sudan	Almajara Aviation																							
Sudan	Marsland							1																
Sudan	Nova Airways							1										4						
Sudan	Mid Airlines																							
Sudan	Sun Air								2															
Sudan	Tarco Air																							
Sudan	Aviatrans																							
Sudan	Air West Cargo																							
Sudan	Ben Air																							
Sudan	Green Flag Aviation																							
Sudan	Kush Aviation																							
Syria	Syrianair																							
United Arab Emirates	Air Arabia																							
United Arab Emirates	Etihad Airways															32	2							
United Arab Emirates	Emirates Airline															157								

COUNTRY	Company	CAIC MA60 M	Embraer 170 M	Embraer 175 M	Embraer 190 M	Embraer 195 M	Embraer ERJ-135 M	Embraer ERJ-145 M	Fokker 100 M	Fokker 50 M	Fokker 70 M	Fokker F_28 M	Ilyushin Il-62 H	Ilyushin Il-76 H	Ilyushin Il-86 H	Jetstream Jetstream 31 M	Lockheed Hercules M	Lockheed L-1011 TriStar H	Tupolev Tu-134 M	Tupolev Tu-154 M	Tupolev Tu-204 M	Yakovlev Yak-40 M	Yakovlev Yak-42 M	Total
Jordan	Barq Aviation																	0						0
Jordan	Elite Aviation																	1						1
Jordan	Privilege Jet Airlines																	1						1
Kuwait	Jazeera Airways																							9
Kuwait	Kuwait Airways																							18
Kuwait	Gryphon Airlines																							2
Kuwait	LoadAir Cargo																							0
Lebanon	Middle East Airlines																							19
Lebanon	TMA																							1
Lebanon	Wings of Lebanon																							0
Libya	Afriqiyah Airways																							14
Libya	Libyan Airlines																							20
Libya	Buraq Air													1										6
Libya	Global Air													1	1									2
Libya	Ghadames Air Transport																							3
Libya	Air Kufra															1								1
Libya	Libo Air Cargo																							1
Libya	Libyan Air Cargo												1	8			1							28
Libya	Air Libya																					3		10
Oman	Oman Air			4																				28
Qatar	Qatar Airways																							144
Republic of Yemen	Yemenia													1			2							14
Republic of Yemen	Felix Airways	3																						7
Republic of Yemen	Barash Aviation													1										1
Saudi Arabia	Saudia		15																					131
Saudi Arabia	nasair				6	0																		30
Saudi Arabia	SNAS Aviation																							3
Sudan	Sudan Airways									3														7
Sudan	Alfa Airlines													2										5
Sudan	Badr Airlines													2										4
Sudan	Blue Bird Aviation (Sudan)																							0
Sudan	El Dinder Aviation													1										1
Sudan	Dove Air Services																		1					2
Sudan	Feeder Airlines									1														1
Sudan	Kata Transportation Company																							2
Sudan	Alok Air																					1		1
Sudan	El Magal Aviation																							2
Sudan	Almajara Aviation													1										1
Sudan	Marsland																							2
Sudan	Nova Airways																							5
Sudan	Mid Airlines									2														2
Sudan	Sun Air																							3
Sudan	Tarco Air																						4	5
Sudan	Aviatrans																							1
Sudan	Air West Cargo													1										1
Sudan	Ben Air																							2
Sudan	Green Flag Aviation																							5
Sudan	Kush Aviation													2										4
Syria	Syrianair													4					4			4		20
United Arab Emirates	Air Arabia																							31
United Arab Emirates	Etihad Airways																							110
United Arab Emirates	Emirates Airline																							250

COUNTRY	Company	ICAO	IATA	Airbus A300-600 H	Airbus A300B2/B4 H	Airbus A310 H	Airbus A318 M	Airbus A319 M	Airbus A320 M	Airbus A321 M	Airbus A330 H	Airbus A340 H	Airbus A380 H	Antonov An-12 M	Antonov An-124 H	Antonov An-140 M	Antonov An-24 M	Antonov An-26 M	Antonov An-30 M	Antonov An-32 M
United Arab Emirates	Falcon Express Cargo Airlines	FCX	FC																	
United Arab Emirates	FlyDubai	FDB	FZ																	
United Arab Emirates	Global Jet Airlines	GBG		2																
United Arab Emirates	Midex Airlines	MIX	MG		4															
United Arab Emirates	Maximus Air	MXU		3																
United Arab Emirates	Rotana Jet	RJD	RG					2												
United Arab Emirates	RAK Airways	RKM	RT						2											
United Arab Emirates	Abu Dhabi Aviation																			
United Arab Emirates	Global Charter Services				2															
United Arab Emirates	MMA Airline																			
United Arab Emirates	Noor Air Company																			
United Arab Emirates	SKA Air & Logistics (SkyLink Arabia)																			
Total				42	22	25	2	14	260	47	138	38	62	4	2	6	2	24	1	4

Company	Antonov An-72 M	Antonov An-74 M	ATR ATR 42 M	ATR ATR 72 M	Avro RJ Avroliner M	BAE SYSTEMS (HS) 146 M	Boeing (McDonnell-Douglas) DC-9 M	Boeing (McDonnell-Douglas) MD-11 H	Boeing (McDonnell-Douglas) MD-80 M	Boeing (McDonnell-Douglas) MD-90 M	Boeing 707 M/H	Boeing 727 M	Boeing 737 (CFMI) M	Boeing 737 (JT8D) M	Boeing 737 (NG) M	Boeing 747 Classic H	Boeing 747-400 H
Falcon Express Cargo Airlines																	
FlyDubai															35		
Global Jet Airlines													3				
Midex Airlines																3	
Maximus Air																	
Rotana Jet																	
RAK Airways																	
Abu Dhabi Aviation																	
Global Charter Services																	
MMA Airline														1			
Noor Air Company																	
SKA Air & Logistics (SkyLink Arabia)												1					
Total	3	6	4	8	9	13	3	4	34	3	3	12	21	9	80	19	7

Company	Boeing 747-8 H	Boeing 757 M	Boeing 767 H	Boeing 777 H	Boeing 787 H	Bombardier (Canadair) CRJ Regional Jet M	Bombardier (Canadair) CRJ700 Regional Jet M	Bombardier (Canadair) CRJ900 Regional Jet M	Bombardier (DHC) Dash 7 M	Bombardier (DHC) Dash 8-100/200 M	Bombardier (DHC) Dash 8-300 M	Bombardier (DHC) Dash 8-400 M	CAIC MA60 M	Embraer 170 M	Embraer 175 M	Embraer 190 M	Embraer 195 M
Falcon Express Cargo Airlines																	
FlyDubai																	
Global Jet Airlines																	
Midex Airlines																	
Maximus Air																	
Rotana Jet																	
RAK Airways																	
Abu Dhabi Aviation										2	3	1					
Global Charter Services																	
MMA Airline																	
Noor Air Company																	
SKA Air & Logistics (SkyLink Arabia)																	
Total	2	3	6	274	25	6	2	15	4	5	8	1	3	27	7	6	5

Company	Embraer ERJ-135 M	Embraer ERJ-145 M	Fokker 100 M	Fokker 50 M	Fokker 70 M	Fokker F_28 M	Ilyushin Il-62 H	Ilyushin Il-76 H	Ilyushin Il-86 H	Jetstream Jetstream 31 M	Lockheed Hercules M	Lockheed L-1011 TriStar H	Tupolev Tu-134 M	Tupolev Tu-154 M	Tupolev Tu-204 M	Yakovlev Yak-40 M	Yakovlev Yak-42 M	Total
Falcon Express Cargo Airlines																		0
FlyDubai																		35
Global Jet Airlines																		5
Midex Airlines																		7
Maximus Air																		3
Rotana Jet		3																5
RAK Airways																		2
Abu Dhabi Aviation																		6
Global Charter Services																		2
MMA Airline																		1
Noor Air Company								1										1
SKA Air & Logistics (SkyLink Arabia)					1	2												4
Total	1	3	39	17	1	2	1	32	1	1	3	2	5	15	4	8	6	1471

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