

Islamic Republic of IRAN

Civil Aviation Organization

Accident Final Report

State File Number: Type of Occurrence: Date of Occurrence: Place of Occurrence: Aircraft Type: Registration: Operator: A13880431UPI6208 Accident July 22th 2009 I.R.IRAN - Mashhad IL-62M UP-I6208 Aria

Safety & Accident Investigation Department

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Islamic Republic Of Iran Civil Aviation Organization Aircraft Accident Investigation Department

Final Report

Basic Information

Type of occurrence:	Accident
Date:	24.Jul.2009
Location:	Mashhad International Airport/ I.R of Iran
Aircraft:	Airplane
Model:	IL-62M
Registration:	UP-I6208
Owner:	DETA Airline
Operator:	ARIA Airline
Date of Issue:	05 Jun 2010

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Foreword:

Civil Aviation Organization is responsible for supervision on correct implementation of laws and regulations and flight standards in civil Aviation industries of the country, according to international commitments and domestic laws of the Islamic Republic of Iran; in this respect, the accidents are investigated , in order to identify threaten resources of safety ratio of flights, based on international regulations and compiled guidelines of International Civil Aviation Organization, ICAO (annex 13). After identifying main causes and contributive factors of the accident, safety

recommendations are issued in order to consider flight standards and regulations, as well as more attention to flight safety for preventing the same accidents.

Written matters in annex 13 of ICAO and relevant appendixes emphasize on this matter that *"The sole objective of the investigation of an accident or incident shall be the prevention of accidents and incidents. It is not the purpose of this activity to apportion blame or liability"*

The main objective of investigating accidents is to achieve main causes and roots for preventing similar accidents in the future.

About IL-62M airplane accident, owned by DETA Airline, Kazakhstan, (leased by Aria Airline) in July 24, 2009, at 08:05 local time (13:35 UTC) on Shahid Hasheminejad International Airport/ Mashhad, The Accident Investigation Team was attended in the place of accident immediately and gathered information; this team receives FDR and CVR of the plane, in order to analyze them.

In this direction, there has been taken necessary actions for correct investigation of technical – operational documents and study about the accident site and body of the plane in order to identify main and contributive causes of this accident and issue safety recommendations for preventing such same occurrences.

The accident investigation team however appreciates Interstate Aviation Commission (IAC) for mutual cooperation in the investigation of accident involving IL-62M with registration, UP-I6208 and preparing final report of this accident.

Synopsis:

Type of the aircraft	Illyushin, model IL-62M	
Registration mark	UP-I6208	
Owner	DETA Airline, Kazakhstan	
Operator	Aria Airline	
Date of accident	July 24,2009	
Time of accident	18:05 local time (13:35 UTC)	
Place of accident	End of left band of Mashhad International	
	Airport	
Damage to airplane	Destroyed	
No of passengers	156 person	
No of crews	17 persons& one additional crews group	
No of fatal	16 persons	
No of injured person	31persons	
Responsible for accident	Aircraft accident investigation & safety	
investigation	Dept. I.R of Iran	
Foreign cooperator	(IAC) Interstate Aviation	
commission	Committee/)Russia · Kazakhstan Civil	
	Aviation Authority	
Main cause of accident	crews mistakes	

1. Factual Information

1.1 History of the flight:

At July 24, 2009, Ilyushin aircraft, model IL-62M of DETA Airline with registration, UP-I6208 and flight no. IRX.1525 of Aria Airline flight with 169 passengers from Mehrabad International Airport/ Tehran, and it has landed at 18:05 local time on RWY 13 L in Mashhad International Airport; then it has run off from end of the runway, without considerable reduction in aircraft speed and it collided with wall of the airport and it was stopped after approximately 185 m.

The mentioned aircraft has been leased by Aria Airline as ACMI, according to contract No. 002/IL-62M/ACMI.

Subsequently, the ground safety unit of the airport has attended in place of occurring accident, by breaking protective fences and barbed wires of the airport, and then they evacuated passengers and extinguished fire outside of aircraft by carrying out necessary actions.

1.2 Injuries to persons:

Injured persons of this accident were carried to hospitals of Mashhad city, after search and rescue operation, bodies of victims were transferred to the legal medicine. The following table shows overview of body injuries to passengers of this aircraft:

Injuries	Crew	Passenger	Others
Fatal	11	5	0
Serious Injuries	2	1	0
Minor	0	28	0
None	7	122	0
Total	17	156	0

1.3 Damage to aircraft:

The aircraft fuselage destroyed totally due to impact to wall of the airport and it caused destroying cockpit and nose section airframe and it can't be reconstructed.

1.4 Other Damage:

Due to impact of aircraft landing gears with net barrier in shoulder of RWY 13L, it has major damages on it and some damages to PAPI light in beginning of RWY 31R.

1.5 Personnel Information:

1.5.1 Pilot in Command :(PF)

Birth year	1957	
Kind of certificate and validity date	Class one validity date	
	28/OCT/09	
Medicine condition	Without medicine limitation and	
	it is valid until 28/Aug/09	
Total flight hours	14200	
Total flight hours with IL-62	1500	
Date and place of last simulator	10/Mar/09 Russia	
Prior accident	None	
License for international flight	ok	
License for radio communication	ok	
Entrance date to Iran	19 July 2009	
Date of first flight in Iran	24 July 2009	
No of flight in Iran	6 flights	

According to available documents, he has done Radio communication but the level of his English conversation was not suitable.

1-5-2 Copilot:

Date of Birth	1962
Kind of certificate and validity date	Class 2 validity date24/Feb/2010
Medical condition	Without medical limitation and it is valid until 24/Feb/2010
Total flight hours	8294
Total flight hours with IL-62	1319
Date and place of last simulator	10/MAY/2009 Russia

Prior accident	none
License for international flight	ok
License for radio communication	ok
Entrance date to Iran	19 July 2009
Date of first flight in Iran	24 July 2009
No of flight in Iran	6 flights

1-5-3 Flight Engineer:

Date of Birth	1957
Kind of certificate and validity date	Class 1 validity
	date28/OCT/09
Medical condition	Without medicine limitation
	and it is valid until
	28/0CT/09
Total flight hours	8747
Total flight hours with IL-62airline	1697
Date and place of last simulator	10/MAY/09 Russia
Prior accident	None
License for international flight	ok
License for radio communication	ok
Entrance date to Iran	July , 17,2009
Date of first flight in Iran	July , 23,2009
No of flight in Iran	6 flights

1.6 Aircraft Information:

The Ilyushin aircraft IL-62M with S/N: 1951525 have been manufactured at 09.06.1989 in Ilyushin Aircraft Factory, and its owner is DETA Air Company, Kazakhstan. It has been registered at June 16, 2008 with UP-U6208, by Civil Aviation Authority of Kazakhstan. It has also received its last certificate of Airworthiness at Jan. 28, 2009 from this state, which it was valid until Jan. 28, 2010.

This airplane has been exploited after upgrading its navigation and telecommunication, as well as installing its passenger oxygen system for flight operation in Iran.

This airplane has been arrived in I.R of Iran Territory, due to agreement No. 002/ IL-62M/ACMI, dated on Nov. 16, 2008 as "wet lease agreement (ACMI) for aircraft IL-62M, between DETA Air, as Lesser and Aria Airline as Lessee at Jan. 17, 2007.

State registry number	UP-I6208
Manufacture number	№ 1951525
Owners	Eugeny V. Zhigayev
	Ibragim A. Paskachev

Operator	ARIA airline. The aircraft owned by D.E.T.A.
	AIR airline was leased under an agreement and
	operated by the airline "ARIA AIR" (IR of
	Iran).
Date of release	09 June 1989
State registration certificate	No.538 dated 16 June 2008
Airworthiness aircraft certificate	No.0538 dated January 28, 2009 valid till
	January 28, 2010
Assigned life time and service life	35000 hours, 7500 landings., 20 years
	(Bulletin No.1440-БЭ),
	Bulletin No. 291-62M was fulfilled on January
	20, 2009, so in accordance with the bulletin the
	assigned service life was extended to 20 years 4
	months, till September 29 2009.
Overhaul life and service time	10200 hours, 2700 landings (Bulletin No.1399
	БЭ), 14 years
	12572 haven 2007 have the se
Operating time since new(ISN)	13573 hours, 3987 landings
Operating time since the last overhaul(TSO)	7876 hours, 2458 flights
Number of overhauls, date of the last overhaul	One overhaul, September 29, 1995
Overhaul life rest	2384 hours, 242 landings
Last periodic technical maintenance	According to the logbook – March 29, 2009,
	form Φ -1K with operating time 7666 hours and
	2338 landings, maintenance sheet №9
Last periodic maintenance	Form 6 15 July 2009, maintenance sheet
	51, Teheran
Fuelling	20 tons
Fuel type	Jet -A1
Incurance cartificate	Kazakhingtrakh Inguranga agraamant Na
	Kazakiniisu akii, iisu alice agreement ivo.
	1//303/08/891

Engines	installed	in the	aircraft:
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Engine type	D-30KU-2	D-30KU-2	D-30KU-2	D-30KU
Serial №	51148802221	51248802214	51219002225	0304022212226
Manufacturer	JSC "Rybinskiye	JSC "Rybinskiye	JSC "Rybinskiye	JSC "Rybinskiye
	motory"	motory"	motory"	motory"
Date of	22 November1988	26 October1988	11 March1990	30 April1982
Operating time	7261 hours,	7425 hours,	7307 hours,	14046 hours,
since new	1836 cycles	1890 cycles	1729 cycles	3536 cycles
Place of the	JSC NPO Saturn	JSC NPO Saturn	JSC NPO Saturn	JSC NPO Saturn
last overhaul				
Date of the	30 December 1999	23 October 2001	14 May 2002	30 March 2000.
last overhaul				
Operating time	3574 hours	3119 hours	1806 hours	3567 hours
since the last	928 cycles	779 cycles	438 cycles	925 cycles
overhaul				
Overhaul life	3637 hours	3330 hours	3000 hours	3627 hours
time	901 cycles	767 cycles	543 cycles	898 cycles
Overhaul life	63 hours,	210 hours,	1194 hours,	60 hours,
time rest	-27 cycles	-12 cycles	105 cycles	-27 cycles

Engines, APU TA-6A, units and assembly parts were operated in compliance with the effective operating regulations.

All four engines had sufficient life times in operation hours to perform flights. According to bulletins No. 1770 and No. 1844 of the engine manufacture JSC NPO Saturn, effective dates February 08, 2002 and June 29, 2007, the first, second and fourth engines had exceeded life time in cycles (27, 16(12), 27 correspondingly). Life times were extended by the JSC "Aerotechservice" (Nikolayev, Ukraine) and JSC "Engine" (Perm).

№ APU	Periodical maintenance	Current maintenance
PU 1	Ф-1К – 21 April 2009	ΦБ – 19 July 2009
PU 2	Ф-1К – 29 April 2009	ΦБ – 16 July 2009
PU 3	Ф-1К - 29 April 2009	ΦБ – 15 July 2009
PU 4	Φ-1K – 21 April 2009	ΦБ – 19 July 2009

Engine maintenance performed:

The airframe, assemblies and units has life time sufficient to perform flight tasks except for the cycle life time for AP units 1, 2, 4. The aircraft had no malfunctions before the accident flight on July 24, 2009.

No complaints were made on technique functioning during the flight. According to information of the flight date recorders, engine and aircraft system operating parameters were in compliance with the assigned modes.

1.7 Meteorological information:

According to the meteorological office report, status of the current air (METAR), in the accident time in Mashhad International Airport (Shahid Hasheminejad) at 24.07.2009 was according to the following table:

		ICAO ID:0	DIMM						
Time		Wind					Pre		
UTC	LMT زمان محلی	DIRECTION (DEG) سمت	SPEED(KT) سرعت	Visibility دید افقی	Cloud میزان و	TEMP/DEW دما و نقطه شبنم	НРА	INCH	Density altitude (feet)
UIC					ار تفاع ابر	RH رطوبت نسبی			
11.50	17:20	60	12	САVОК		۳0/M05	1013	7 ٩,91	6299
11.50						7.52 %	1015		
				САУОК		34/M03			
12:50	17:20	80	14			9.24 %	1012	29.89	6235
		0 60	14	CAVOK		33/M04		29.90	6124
13:50	18:20					9.06 %	1012		

There were not any effective metrological factors that could affect on operation of the aircraft.

1.8 Aids to navigation:

Mashhad international airport is equipped with aid to navigation systems as below:

NDB		385KHZ					
DVOR/DME		11400 MHZ					
LLZ		109.900MHZ					
ILSGP	•	333.800MHZ					
ILS/DME		CH36X					
According to	available	documents	at	accident	time.	all	navigation

According to available documents at accident time, all navigational systems operations were normal

1.9 Communication:

Mashhad international airport equipped to communication system as below:

	Frequency	Time	Notes
APP:	127.300 MHZ	H24	
	121.500 MHZ	H24	Emergency
			frequency
	353.800 MHZ	H24	Military frequency
TWR:	118.100 MHZ	H24	
	121.700 MHZ	H24	
	121.900 MHZ	H24	
	257.800 MHZ	H24	Stand by For all VHF
	243.000 MHZ	H24	UDF, Military
			Aircraft Military
			Emergency
ATIS (INFO)	126.400 MHZ		

Communication and conversation from the flight control units & CVR of aircraft have shown the correct operation of these systems.

1.10 Aerodrome information:

Mashhad international Airport of (OIMM) has aerodrome reference point with geographical coordination 361403N 0593842E in MAG 312 Deg with elevation of 3226 FT RWY 13L threshold.

Its direction and distance is as East and 3 Km from Mashhad, its height from sea level is 3263 ft, and its temperature degree reference is 34.1 °C.

There are permission IFR/VFR flights in this airport. Fire fighting facilities of Mashhad INTL Airport is in CAT7. It has two Runways in direction of 13/31 L, R with 3811 * 45 m dimension. About this accident, there weren't any faults in this regard.

1.11 Flight Recorders:

<u>FDR</u>

The aircraft was equipped with flight data recorders MSRP-64 and MSRP-12-96. A tripartite recorder K3-63 was not installed in the aircraft. The recorders were retrieved from the accident site by Iranian accident investigation team. Data readout was carried out at a facility of the "PARS Aviation Service" company. The information from the MSRP-12-96 recorder was not downloaded. The cassette KS-13 of the accumulator KBN as well as the magnetic tape of the tape media MLP-14-5 of the onboard recorder MSRP-64 were in satisfactory condition and had the parametric accident flight data recorded on them. On the pictures below some readout results are shown:

















CVR:

The aircraft IL-62M was equipped with a CVR MARS-BM with a total record time of 30 minutes. The recorder was retrieved from the accident place by Iranian accident investigation team. The information readout was performed at a facility of "PARS-Aviation Service Company". The magnetic tape of the recorder was in a satisfactory condition so the accident flight data was recorded. Preliminary download of the cockpit conversation and voice identification was also conducted by representatives of Kazakhstan Civil Aviation Committee and D.E.T.A. AIR airline. The final transcript of cockpit radio communication with time synchronization was made by the Air Accident Investigation Scientific and Technical Support Commission of the IAC.

1.12 Wreckage and Impact information:

Accident site inspection revealed that the aircraft position had coordinates N 36,218° E 59,666°, at a road in the vicinity of the aerodrome, 1km away from the RWY-31R threshold (130° MH or 133, 5° TH) of the Mashhad airport with the azimuth of 125° (true).

Power line along the road was destroyed by the right aircraft wing. Wing fuel tanks of the right wing were damaged evidenced by fuel leaking. Main and emergency exits were open. An inflatable slide was dropped down from the port side. No evidences of fire on board and at the accident site were found.

First tracks of intensive braking (black tire tracks) were found at the concrete at a distance of 550 m from the departure threshold of RWY31R. The track of the main gear wheels was going along the RWY in its left part, and diverging further to the right beyond the departure threshold. At about 100m away from the threshold at the end portion of the braking way, a net barrier was found (textile aerodrome emergency braking unit).

The aircraft ran over the RWY when moving along the right side of the stop way, 300m long. Beyond the end of the RWY landing gear wheels track could be clearly seen passing over a rough partly grassed surface, and crossing a dirt road. At a distance of 100m from the RWY end, where the right gear crossed the road, a destroyed tire tube was found, which presumably belonged to the right gear front wheel.

At a distance of 160m from the RWY end smashed approach lights were found, and after that point the gear wheel track started to diverge to the left from the RWY centerline. The front gear wheel track further merged with the left gear wheel track and extended joining the forward airframe track. At a distance of 320 m from the RWY end another line of broken approach lights were found. Airframe structures were found before the approach lights (along the aircraft way). From that point small aircraft structure pieces were found along the whole aircraft path. 40m past the destroyed approach lights line a ditch of 0,5...1m in depth was found (with an underground pipeline) which was crossing this area from the south to the north.

The south-eastern part of the aerodrome was fenced with a brick wall of 2,5m high and 0,4m thick with a concrete strip foundation. It went along the RWY there. The aircraft collided with the fence at a distance of 820m from the departure threshold (520m past the stop way end) with a heading of 105 degrees. The fence was destroyed throughout 70m.

Debris of the nose part of the airframe, cockpit, passenger seats, aircraft cabin parts were found behind the fence. Earlier aerodrome employees, police and medical services found at the site and evacuated crew bodies, as well as killed and injured passengers. After the collision with the fence the aircraft kept moving for 160 m with a heading of 105 degrees and came to a stop at the road.

Layout of accident site:



Detailed description of aircraft, systems and engines damage

After landing at the RWY13 the aircraft ran over the RWY at a high speed. The aircraft passed the RWY end with breaking the protective net barrier. Further the aircraft moved along the stop way deviating to the right and then to the left at a soil road. There were tracks of aircraft movement at the soil road after running over the RWY. The tracks looked like tracks from the front, left and right landing gear wheels.



Photo 1. Tracks of aircraft movement over the dirt road after running over the RWY



Photo 2. Tracks of aircraft movement over the dirt road after running over the RWY

Due to emergency braking after running over the RWY the front right wheel of the right main gear was destroyed. The aircraft ran over the RWY at a speed of about 200 km per hour.

The aircraft moved to the right and broke several approach lights at a concrete footing. When moving over a rough terrain due to a high speed, the aircraft front gear was broken. At a distance of 350m from the runway, there was a ditch 2m wide and 1m in depth. As the aircraft got into the ditch at a speed of about 185 km per hour the front gear was completely broken. Further the left main gear got into the ditch followed by aircraft turning to the left. As the front gear was broken the aircraft moved on sliding on the airframe nose. Further the aircraft hit the brick wall concrete base 2,5 m high at a speed of 120 km per hour. This resulted in destruction of the cockpit and the airframe up to frame 22 (6th seat row). The distance from the RWY end to the place of the collision with the fence was 880m. Then the aircraft moved 160m more and came to stop. There was no fire on board.

Wires of the power line passing outside the aerodrome were ruptured by airframe structure elements.

The aircraft leaned on the tail part of the airframe with a little bank to the port side. The flaps were fully extended, spoilers retracted, reverse flaps open; the stabilizer was set 1,8 degrees pitch up.



Photo 3. Aircraft post-accident overall view

During the accident the aircraft got sever damage as follows:

- The cockpit and the cabin up to the frame 22 (the 6^{th} seat row) were totally wrecked.

- The nose part and lower wing panels were heavily damaged.

- The right flaps (inner and outer) were sheared off.

- The left flap had got substantial damage.

- The front gear was torn out from the attachment points, between main gears, between frames 58 and 62.

- The right main gear flap was sheared off.

- Main gears had major damage and the right gear front right wheel was wrecked.

- Lower flaps of power units 1 and 4 and flap control elements had significant damage.

- Control linkage was totally destroyed up to the airframe nose destruction line; beyond this no damage found.



Photo 4. Airframe nose (destroyed up to frame 22)



Photo 5. Left wing structures damage



Photo 6. Right wing structures damage



Photo 7. Right (outer) flap's damage



Photo 8. Front right gear (torn out of attachment points), destroyed right inner flap



Photo 9. Right main gear flap sheared off



Photo 10. Right main gear destroyed wheel



Photo 11. Power unit 1 reverse flaps



Photo 12. Power unit 4 reverse flaps



Photo 13. Power unit 4 front power lever



Photo 14. Power unit 4 rudder shackle of padlock

As the cockpit was completely destroyed it appeared not possible to determine throttle positions, instrument data and switches positions.

All structure damages occurred once after the aircraft had run over the RWY, when it was moving over terrain, and resulted from the collision with obstacles (the ditch, lights concrete footing and brick wall). There were no tracks of destruction resulting from fatigue.

No evidences of ailerons, rudders and elevator jamming were found. Spoilers were in the retracted position. The flaps were fully extended.

The aft fuselage had no visible damage. The stabilizer setting was changed by the crew during the landing run from 5,6 degrees pitch up to 1,8 degrees pitch up (according to the MSRP–64). The rudders were not fixed. There was no stabilizer position indication on the fin.



Photo 15. Stabilizer position – 1,8 degrees

1.13 Medical and pathological information:

Crew of this flight has valid medical license from Kazakhstan civil Aviation Authority and they had not medical problem for the flight.

By considering to collision the airplane with the wall, flight crew and front passengers have been injured by hitting it, and they have been dead, because of this collision. After transferring bodies to the forensic medicine of Mashhad, necessary pathological test were carry out ,and samplings from the flight crew was done, and it was determined that they don't have an especial deficiencies about using drugs and alcohol.

1.14 Fire:

After this accident, the ground safety of Mashhad Airport sent fire extinguish vehicles to the site of this accident immediately, but they only extinguished a small fire in plants and thorns of around the airplane caused by friction, because there wasn't observed a considerable fire in the airplane.

As wreckage of the airplane has been located near the flammable gas line, these vehicles have remained in this site until carrying out it to a safe place, in order to prevent fire and explosion of the pipe.

1.15 Survival aspects:

After this accident, ground security and research & rescue units of Shahid Hashemijejad Airport (Mashhad) began their efforts, in order to allocate place of accident, to rescue passengers and crew. By considering to condition of the region and location of the airplane outside of the airport, there were taken necessary actions by cooperating ground safety and extinguish staffs, and other research and rescue organs; the passengers were evacuated from aircraft wreckage, and injured persons were transferred to hospitals of Mashhad.

1.16 Test and Research:

None

1.17 Organizational and management information:

According to contents ATC records of Shahid Hashemijejad Airport (Mashhad), after this accident, the control tower in Mashhad Airport has reported this accident to the relevant authorizations, which there have been taken necessary actions, in order to initiate search and rescue operation.

There have been carried out all actions about search and rescue, transferring bodies to the forensic medicine of Mashhad and identify their identity, flight crew and passengers.

1.19 Useful or effective investigation Techniques:

The standard and normal techniques were applied.

2. ANALYSIS:

After joining landing course the flight altitude was 7000 ft, distance from the RWY end 22 km. The aircraft was preceded by another aircraft approaching to land, which had been cleared to land earlier. Being instructed by a controller to reduce speed due to the proceeding traffic, approaching to land, the captain decided to make left orbit and informed the crew about that. Upon a navigator's request the controller cleared to perform left orbit maintaining 7000 ft.

No evidences of task sharing regarding flying the aircraft before descending from the FL to approach to land were recorded. By some navigator's words one can judge that it was the captain who was the flying pilot: Kolya, 7000, climb, climb Kolya!.

The aircraft landing weight was 93.7 tons. Data on the landing weight, landing approach speed, approach chosen, and alternate aerodrome were not voiced during the pre-landing preparation (not proceeding check list). After joining landing course the controller cleared to descend to 6000 ft, at a distance of 13 km from the RWY end. As the aircraft approached to the RWY the navigator reported the distance: Distance 6, distance 5, flying above. After crossing the 5 km distance the navigator without a captain's command read out the checklist: landing gear down, brakes, spoilers, altitude selector. No answers to the voiced checklist points were recorded.

Further the navigator goes on counting distance: distance 2 km, distance 1, altitude 40m. When passed distance 1 km, the co-pilot gave a command (which was supposed to be given by the PIC) to set idle: "Idle". The flight engineer confirmed: "Idle", but according to the MSRP-64 data idle was set before the command. Flight speed along the glide path was 325 km/h, which was 50 km/h more than the assigned speed for a landing weight of 93 tons. The rate of descent was 10 m/sec. During the descent the GPWS

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warning activated several times. The RWY end was crossed at a height of 31 m and at a speed of 310 km/h.

At a height of 22m the flight engineer shifted trust reverses to a reverse thrust position without a captain's command. No report "Lever latched lights on" about the shift was made. The landing was performed (according to the calculation made) at a distance of 1000 m from the RWY threshold at a speed of 275 km/h (instrument speed).

According to the MSRP record before landing the flight engineer shifted engine's 1 and 4 trust reversers to the forward thrust. After landing and extending the front gear down, the co-pilot (it is a captain who should give command) gave the command "Reverse", without any monitoring by either of them of engine trust reversers position indication at the instrument panel. The flight engineer without checking out the thrust reverse lever position and trust reversers position indication and reading back ("roger, reverse on") set throttles of engines 1 and 4 at the maximum trust.

Note: It should be noted that as for that aircraft type, if the reverse lever is in the "Reverse" position, throttles cannot, due to their design, be set at a position over the "Nominal" mode (80...90 degrees according to thrust mode indicator).

The actual record of the MSRP-64 contained record of the flight mode implied on engines 1 and 4, which is possible only in case reverse thrust lever is set at the "forward thrust" mode. There was no reporting "reverse engaged". No command was given to activate spoilers, which were not extended upon landing. The co-pilot set the stabilizer from 5, 6 degrees pitch up to 1, 8 degrees pitch up.

Just at the same time upon landing (2 seconds later) inner engines were shut down by the flight engineer. Nevertheless the aircraft did not brake as the trust reversers were shifted to forward thrust. The mode was maintained for 12 seconds. According to navigator's reports, which were consistent with the MSRP record, the speed began to increase. The navigator informed the crew about increase of speed. According to the MSRP a speed of 280 km/hour was reached. After the navigator informed about increase of the speed, the flight engineer shut down engines no. 1 and 4.

The MARS-BM record contains crew members' voices record: Co-pilot – "Leaving", Navigator – "Brakes", Co-pilot – "Why isn't reverse functioning?" the PIC – "because flaps are not shifted", Navigator – "Emergency braking".

MSRP-64 record contains multiple change of throttle position of engines 2-3 and 1-4 before the flight mode, as well as shifting trust reversers, but it was done with engines disengaged. Crew's actions, engine parameters, flaps position are consistent with the readout chart.

It should be noted that crew's actions when landing did not comply with the Crew Interaction and Procedure Instruction for the case of landing with reverse engaged, under the Operating Manual of the IL-62 type (Tab 4.1).

Wheel Braking, including emergency braking, was not effective. The aircraft ran over the RWY at a speed of 200 km/hour, deviated to the right after the front right wheel tire of the front right gear blew out. Further on, it broke some approach lights, with a concrete base, crossed the net barrier had its front gear broken and then at a speed of 185 km/hour got into the ditch, up to 1 m in depth and 2m in width, which traversed the aircraft's path at an angle, had its front gear broken down. Then due to its left gear getting into

the ditch as well, turned to the left facing the brick wall with a concrete foundation. As the front gear was broken, the aircraft moved on its forward fuselage and at a speed of 120 km/hour collided with the concrete foundation of the brick wall 2,5 m high. As a result of the front impact the cockpit and airframe up to frame 22 (6th seat row) were totally ruined. The crew and some passengers, who were in the first cabin, were killed.

The aircraft moved on over the dirt for 160m, broke the power line and came to a stop. There was no fire on the aircraft after the stop.

It should be noted that several accidents with aircraft IL62M took place before, which occurred due to the lack of accurate interaction between captain and crew during landing with thrust reverse involved.

In most cases these accidents were a result of non-authorized flight engineer's actions to shift engine trust reversers at heights more than these recommended in the FM, followed by their shifting to forward thrust and setting engines 1 and 4 at the flight mode. Another cause was an unmonitored thrust lever position (not latched) and position of engine trust reversers indication before setting engines at the maximum braking mode, which resulted in running over the RWY.

Table	4.1.	Il-62M	crew	interaction	checklist	to b	be	fulfilled	at	landing
with t	hrus	t reverse	e enga	ged						

Flight	At the command of captain "Idle", read it back and reduce
engineer	engine power to idle.
PIC	By the end of flaring at the idle mode give the command: "Shift
	flaps" (with a glide path angle under 3 degrees 30 min. At a
	height of no more than 5 m give the command "Shift flaps"
	(with a glide path angle no more than 3 degrees 30 min)
Flight	At the captain's command "Shift flaps" read it back. Shift the
engineer	reverse control lever of engines 1-2 from the position

	"REVERSE OFF" to the position "REVERSE ON". Check by
	the indication display whether the reverse flaps are shifted and
	report "Lever latched lights on".
PIC	At a height of 1-2m, if necessary, give the command
	"Reverse". By the end of flaring prevent increase of pitch angle
	and touch down the RWY by the main wheels. Upon landing
	manipulating the rudder, match the aircraft axis with the RWY
	centre line, put down at the RWY the front gear (in 2-3
	seconds), give the command "Reverse" (if reverse was not
	engaged earlier) and activate the front gear control. Fix the
	control column in the "Push" position; give the command
	"Spoilers".
Flight	On the captain's command "Reverse" read it back, set engines
engineer	1 and 4 throttles at the maximum reverse thrust mode (to the
	"Reverse" stop) and report: "Reverse engaged".
	Upon the captain's command "Spoilers" read it back, extend
	spoilers to the maximum angle and report: "Spoilers extended".
	Make sure that the engines 1 and 4 parameters are consistent
	with the reverse thrust mode.

THROTTLES AND THRUST REVERSE LEVER CONTROL

SYSTEM





3. CONCLUSIONS:

3-1 Findings:

- The crew was not trained &acquainted with flight conditions in the Iran territory with an Iranian instructor pilot and the operation unit of Aria Airline has acted so weak regarding those mentioned subjects.
- The approach speed of aircraft was higher than recommended available airport charts & aircraft weight, however it was controllable if the crew could proceed to land correctively.
- The crew had not done correct procedure according to the aircraft Standard Operation Procedure (SOP) to use related check lists. (Descend-Approach-Landing)
- There was lack of precise coordination between flight crew on their self responsibility during the approach and landing.
- The flight crew did not pay attention to EGPWS warning, and did not take corrective action.
- The crew did not use engine reverser and spoiler systems correctly to reduce aircraft speed during the landing and consequently it caused to loose long Runway distance.
- The flight crew had not good English language proficiency. And they were poor in England language conversation.
- The Capitan of the aircraft as the pilot in command had not sufficient force and efficient management in the cockpit.(lack of Cockpit Resource Management).
- There were unauthorized actions of flight engineer for shifting engine reversers as well as lack of mutual oversight by crew members in checklist accomplishment during approach and landing.
 - The crew has had disagreement about "Go around" due to unsuitable landing situations.
 - Presence of General Director of airline in the cockpit had adverse psychological effect on crew efficiency behaviors.

• The DETA airline did not use correct procedure to extend engines No; 1-2-4 life time from Ukrainian company (Aerotechservice co.) and the technical manager of ARIA airline did not control and supervise the matter accordingly.

3-2 Main Cause :

Considering those items in factual information and analysis, the main cause of this accident is "weak Cockpit management between the crew" to use correct landing techniques same as releasing Engine trust reversers – Engine shut down in unsuitable time -

3-3 Contributive Factors :

Some of contributive factors for this accident occurrence are noted as:

- The copilot and the flight engineer had self activity& decision without the (PIC) coordination.
- The cockpit crew was careless and not paying proper attention toward EGPWS warning.
- Psychological adverse effect on cockpit crew because of presence of General Director of Aria airline

3-4 Violation & other deficiencies:

The accident investigation team encountered some violations and deficiencies with ICAO Standards and Iran Local Authority regulation (CAO) which are descript as:

- Poor and in-sufficient supervision controlled of operation &technical manger of Aria Airline.
- The DETA airline has not used proper procedure to receive life time extension of engine and has not passed necessary information to Iranian and Kazakhstan Authorities.
- It has not been designed a headset for flight engineer to make more coordination between the crew, by the aircraft design bureau.
- The crew was not familiar with Iranian AIP completely.
- The total on board persons was not according to written load sheet.

4- SAFETY RECOMMENDATIONS:

In order to prevent the similar events, the Aircraft Accident Instigation &Safety of IRI CAO recommends:

- ✓ A special working group (Board) between Iranian airlines which used Russian leased aircraft and Russian airlines, be established and study how to obtain life extensions and modifications from Russian authorities as a state of design & manufacture.
- ✓ Those Iranian airliners that are willing to have foreign pilots shall provide training courses, such as Iran routs and necessary arrangements for crew members just before beginning of their flights.
- ✓ All foreign pilots should be checked by a related instructor pilot or a CAO designee pilot.
- ✓ The IL-62 cockpit should be equipped with flight engineer headset by the ILYUSHIN Design Bureau.
- ✓ The ILYUSHIN Design Bureau should study and investigate why ELT has not activated by the sever impact.
- ✓ Presence and entering passengers or any other persons than crew should really be forbidden during landing and take off by airlines.
- ✓ The Interstate Aviation Committee (MAK) and Aircraft Accident Investigation Department of IRI CAO should deliver notified findings of this accident to related airlines.
- ✓ It is recommended that a correct procedure of foreign pilot operation in the Iran territory should be defined by operation department of IRI CAO with cooperation of airlines.
- ✓ All airlines that are willing to use leased aircrafts should have sufficient supervision just before to start operation, should check and accomplish the written MOU between authorities and also consider those items in "Art 83 Bis ".