JOINT STOCK COMPANY
"Sukhoi Civil Aircraft"

APPROVED BY
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ENGINEERING SOLUTION
on continuing airworthiness of RRJ-95 aircraft

№RRJ0000-OR-001-4639/A

A. Clarifications

Several events of slatless landings were observed during aircraft RRJ-95 operation accompanied with EWD CAS-messages F/CTL SLATS FAULT, F/CTL SLATS LOCKED on approach. This slat failure to extend was caused by slat transmission torque limiter tripping. Aircraft have been landing with non-extended slats and flaps with FLAPS 1 position pursuant to FCOM.

The investigation and analysis of slat failures to extend events showed that in some combinations of flight loads lateral (diagonal) offset of tracks relative to the actuator output gear axis occurs that can lead to the excess of torque limiter margin upon slat breakout in the course of their extension.

SCAC has developed the Engineering Solutions No. RRJ0000-OR-008-3331/A dated 04.06.2012, No. RRJ0000-OR-008-3640/A dated 23.10.2012 and No. RRJ0000-OR-001-3720/A dated 14.11.2012, on the basis of which IAC Aviation Register has issued the Airworthiness Directives No. 2012-27-01 dated 05.06.2012, No. 2012-27-01 Revision 1 dated 26.10.2012 and No. 2012-27-01 Revision 2 dated 19.11.2012.

In order to prevent the slat tracks' skew SCAC has issued and released a service bulletin (SB) N°RRJ-57-00022-БД for the operating fleet regarding installation of additional side stops on the slat tracks. Design changes corresponding to those that were made pursuant to the SB are implemented in the serial production from aircraft 95039 and further.

However, in the course of subsequent aircraft RRJ-95 operation the recurrent events of slatless landings were observed: RRJ-95B RA-89006 (s/n N°95014) on 02.06.2013 and 07.09.2013, RA-89005 (s/n N°95013) on 01.09.2013, RA-89015 (s/n N°95029) 20.10.2013.

The joint investigations carried out by SCAC together with the manufacturer of the control system - Liebherr-Aerospace Lindenberg GmbH (LIEBHERR) showed possible moisture accumulation in the slat control system geared rotary actuators (GRAs) due to high humidity of the atmosphere that is characteristic of a spring-autumn period. At low temperatures corresponding to a cruise flight altitude the frozen moisture can entail GRA non-breakout due to torque limiter tripping.

To prevent moisture accumulation in the GRAs LIEBHERR is developing a set of corrective actions to insure operability of the slat control system GRAs at high atmosphere humidity.

Furthermore, for improvement of the wing high-lift device control system reliability SCAC and LIEBHERR are approaching the final stage of a new FCS SW version certification that will allow to unlock the control system for the second attempt of high-lift device extension in the event of slat failure to extend.

For the moment prior to the implementation of the above-mentioned design changes SCAC has elaborated an updated landing procedure with flaps extension in FLAPS 2 position, making possible to decrease the landing speed and to reduce the runway length required for landing. This procedure is approved by the IAC Aviation Register and is included in the Aircraft Flight Manual (AFM) for aircraft RRJ-95 (M7.92.0AFM.000.000.RU Revision D, Version 08 and consecutive ones) and in the Flight Crew Operation Manual (FCOM) for aircraft RRJ-95 through Temporary Modification No. 212.

For the time being until the implementation of design modifications, which are being developed by LIEBHERR, it is necessary to carry out the following corrective actions listed below.

B. Corrective Actions

1. Aircraft RRJ-95 operators to follow the guidelines of a Temporary Modification No. 212 dated 21.10.2013 of the Flight Crew Operation Manual (FCOM) for aircraft RRJ-95 (M7.92.FCOM.000.000.RU Revision A) developed on the basis of the Aircraft Flight Manual (AFM) Section 4.27 for aircraft RRJ-95 (M7.92.0AFM.000.000.RU Revision D, Version 08 and consecutive ones).

2. Aircraft RRJ-95 operators to perform simulator training of the FCOM procedure Section 4.27 F/CTL FLAPS/SLATS LOCKED/FAULT taking into account piloting technique peculiarities specified in the FCOM Section 4.20 concerning landing procedure with not extended slats.