Global Exec Aviation
Learjet 60
Columbia, South Carolina
September 19, 2009
DCA08MA098

National Transportation Safety Board
Washington, DC

Survival Factors Group Chairman's Report

Attachment 4

Runway Friction Survey

7 pages

Runway Friction Survey Performed by :

ENTER YOUR INFORMATION HERE

Customer
Columbia Metropolitan Airport

Survey Location
Main Runway. Columbia Metropolitan Airport
Runway 11-29

Procedure :

A Runway friction test was performed at Columbia Metropolitan Airport on the 22nd September 2008. This test was conducted by Columbia Metropolitan Airport, using the Dynamic Friction Tester (DFT), manufactured by NAC Dynamics LLC. The serial number of the test vehicle was NAC026.

The survey was performed with the self-wetting system 'ON'. This system dispels 1mm (0.04") water depth in front of the friction test tire. The water flow rate was calibrated by NAC Dynamics LLC on the 18th December 2007 to ensure that the amount of water produced for the required water depth was consistent and applied evenly for all test speeds.

The DFT is fitted with test tires of the following standard: ASTM E1551-93a (1998) Standard Specification for Special Purpose, Smooth-Tread Tire.

The test procedure was performed in accordance with FAA Advisory Circular No: 150/5320-12C.

The runway was visually checked upon arrival along its entire length. This procedure is used to measure the runway and to set up starting locations and braking points. This initial visual inspection also surveys for changes in friction characteristics of the runway, such as change in texture depth, heavily painted areas* or runway surfaces cracking.

Lateral location of the friction survey was determined by the predominate aircraft operating on this runway, this was determined to be "wide body aircraft", therefore the survey was performed 10 feet to the right of the centre line, in the direction of 11 directions.

This initial test will be used to determine if rubber removal is required. Therefore only one test speed was selected. Friction Surveys were performed at 40mph (65kmph). The tests performed at 40mph determines the runways macrotexture / contamination / drainage ability.

Note 1 : Heavily Painted Areas on the surface decrease texture depth, therefore usually yield lower friction readings.

Table 1 – Friction Level Classification for Runway Pavement Surface using the NAC DFT™ Friction Tester

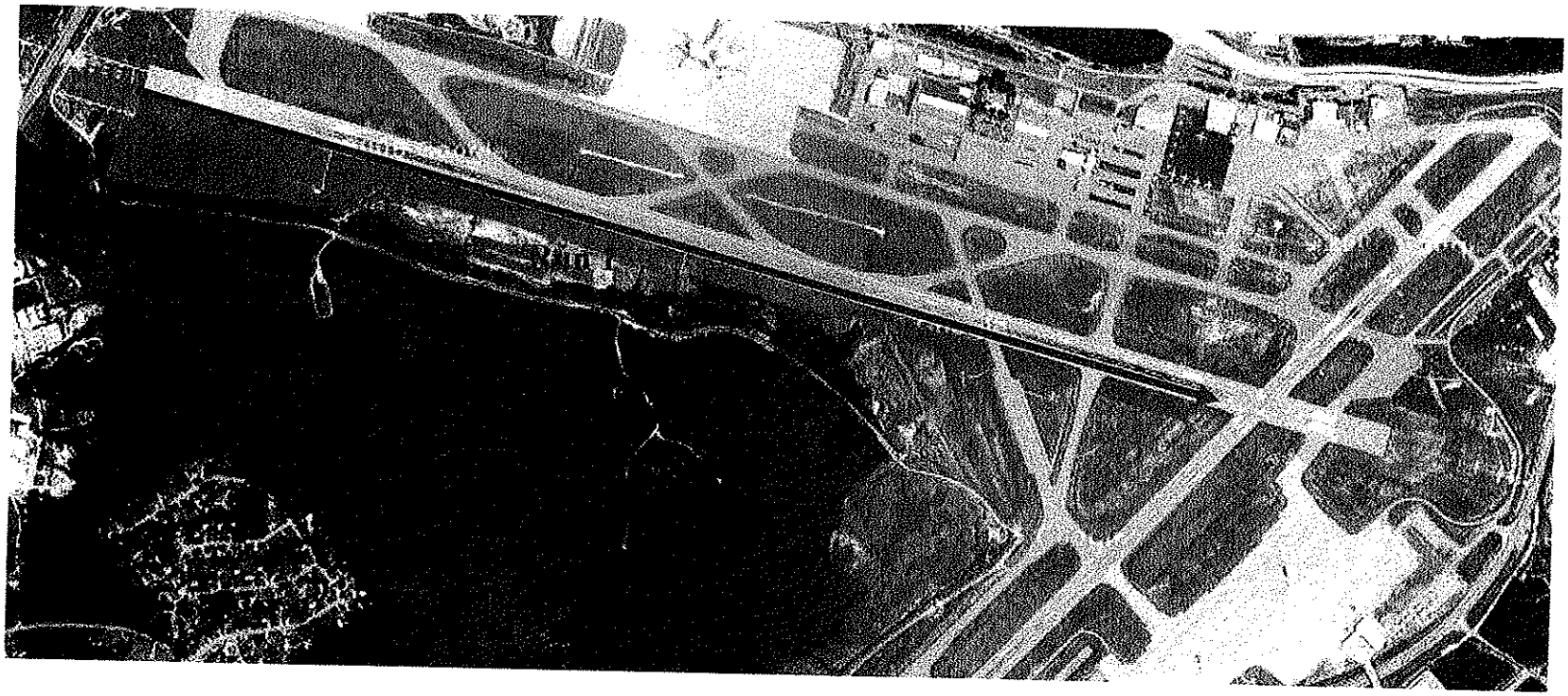
	40mph (65km/h)			
	Minimum	**Action**	**Planning**	**Design**
DFT Friction Machine	<0.41	0.42	0.52	>0.53

Friction Deterioration below the Planning Level (500-foot segment).
When the average Mu value on the wet runway pavement surface at 40 mph is less than the Planning Level but above the Action Level in Table 1 for a distance of 500 feet and both of the adjacent 500-foot segments are at or above the Planning Level, no corrective action is required. These readings indicate that the pavement friction is deteriorating, but that the situation is still within an acceptable overall condition.

Friction Deterioration Below the Planning Level (1000-foot segment).
When the average Mu value on the wet runway pavement surface in a rubber deposit area at 40 mph is less than the Planning Level in Table 1 for a distance of 1000 feet or more, the airfield manager should initiate a project to have rubber removed from the affected areas of the runway before the next friction test is scheduled.

Friction Deterioration Below the Action Level.
When the average Mu value on the wet pavement surface in a rubber deposit area at both 40 is below the Action Level in Table 1 for a distance of 500 feet, and both of the adjacent 500-foot segments are below the Planning Level, action should be taken immediately to remove rubber from the affected areas of the runway and a Notice to Airmen (NOTAM) should be issued, warning pilots of the loss in friction, *when wet.*

Arial View : **Columbia Metropolitan Airport** – Courtesy Google Map



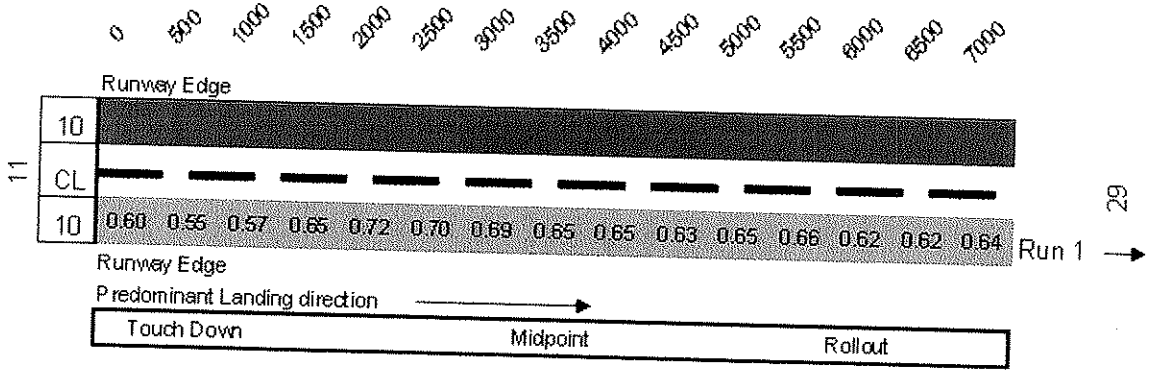
Results Summary

Table 2 : 2 Dimensional Plan View of Runway Showing Average Friction Readings **Every 300 Feet**

Site Location Columbia Metropolitan Airport

Runway Number 11-29

Test Performed at 40mph



40mph Test

Summer OP's

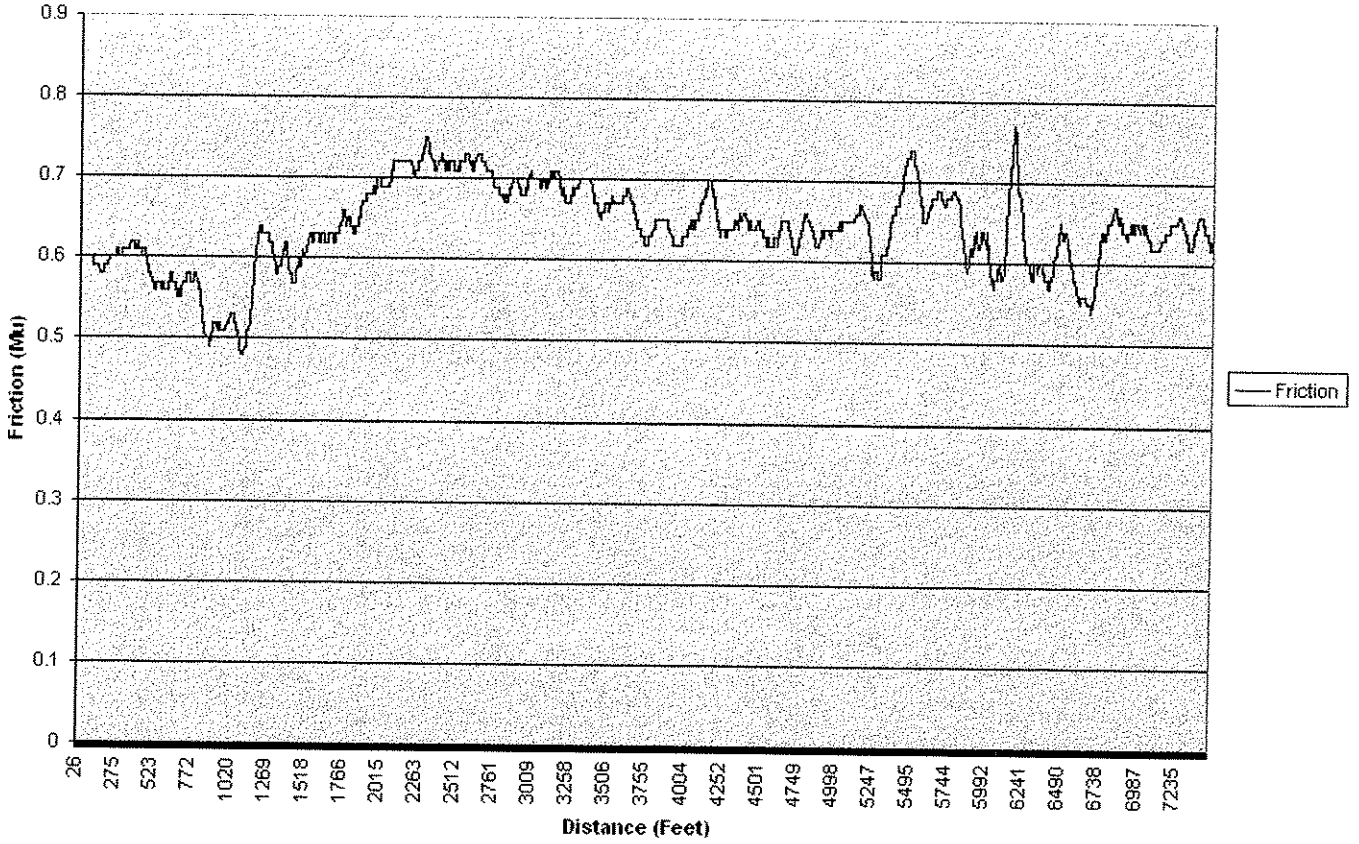
Winter OPs

Key Range

		Minimum Value		Maximum Value
	Nil	0.00	-	0.41
Action Level	Poor	0.42	-	0.44
Planning Level	Fair	0.45	-	0.51
Design Objective Level	Good	0.52	-	1.00

Refresh Chart

Chart 1. Friction Trace against Distance (Feet) - Direction 11



Conclusion

This report has been prepared for Columbia Metropolitan Airport to determine the need for Rubber Removal on the runway and to ascertain the friction level classification for the runway.

The test was started directly on the threshold line in direction of 11 to the right of the centre line. The test was started at the correct speed of 40mph. The deceleration data has been removed from the analysis.

It is noted that acceleration and deceleration of the tow vehicle has the potential to affect the Friction values. During this test the speed was maintained to within +/-3% as required by the FAA.

The overall Friction values obtained from this test shows that the runways surface has good drainage ability at both 40 and 60mph – Total Average Friction 0.64. No 500 foot section falls below the "Design Level".

Total Average Friction for Direction 11 – 0.64 Mu

NAC Dynamics recommends a further test on this runway within 6 months (dependant on runway usage) to continue to monitor the surface drainage ability.

Note :
This test was only performed under self-wetted conditions, it is recommended that the airport operator should conduct visual checks of the runway surface during rainfall, noting the location, average water depth, and approximate dimensions of any ponded areas. If the average water depth exceeds 1/8 inch (3 mm) over a longitudinal distance of 500 feet (152 m), the depressed area should be corrected to the standard transverse slope. If possible, the airport owner should conduct periodic friction surveys during rainfall through the ponded areas.

Test Conducted by

Tamie Risinger