Federal Aviation Administration

Memorandum

Date: DEC 10 2007

To: All Airports Regional Division Managers

From: Rick Marinelli, Manager, Airport Engineering Division, AAS-100, x77669

Prepared by: George Legarreta, Engineer, Airport Engineering Division, AAS-100, x78766

Subject: Engineering Brief No. 65A:
Use of 150-Foot- (45-M) Wide Runways for Airbus A380 Operations

Engineering Brief No 65A, ***Use of 150-Foot- (45-M) Wide Runways for Airbus A380 Operations,*** is attached. The engineering brief provides airport operators and FAA Airports Regional Offices guidance when airports operators must file a modification to standard (MoS) and construction options to address the operational requirements imposed by Flight Standards on A380 landing and takeoff operations (appendix A of attachment).

Airports Regional Division Managers have the authority to approve MoSs that meet the conditions of this engineering brief. Issuance of a MoS requires a copy be sent to the Airport Engineering Division, AAS-100.

Attachment

ENGINEERING BRIEF NO. 65A

USE OF 150-FOOT- (45-M) WIDE RUNWAYS FOR AIRBUS A380 OPERATIONS

December 10, 2007

A. BACKGROUND

In February 2004, Engineering Brief (EB) No. 65, *Minimum Requirements to Widen Existing 150-Foot Wide Runways for Airbus A380 Operations,* was issued that covered a permissible alternative to temporarily widen an existing 150-foot (45-m) wide runway to accommodate limited operations by the A380.

On July 17, 2007, the Flight Standards Service issued a memorandum to the Office of Airport Safety and Standards describing the Flight Standardization Board's (FSB) findings for the A380 (see attachment A). In addition to the normal FSB tasking, the evaluation team focused on two unique operational issues: operations on runways as narrow as 150 feet (45 m) wide and taxiing on taxiways as narrow as 75 feet (23 m) without taxiway centerline lighting and without the aid of the taxi camera system (see EB *No. 63B, Taxiways For Airbus 380 Taxiing Operations.)*

Regarding the former operational issue, the team found that the A380 could be safely operated on runways as narrow as 45 meters with the use of average pilot skills and knowledge. Therefore, the following statement will replace the current statement in the FAA Airbus A380 Aircraft Flight Manual for minimum runway width requirements.

> "This aircraft has been shown to be safely controllable and to be compliant with applicable airworthiness requirements when operating on runways with a width of 45 meters (150 feet) or more."

Additionally, the FAA will issue domestic and/or foreign air carriers (operating into the United States.) operating the A380 Operations Specifications that specify the following two requirements:

- Runways for takeoffs and landings shall be at least 45 meters (150 feet) wide with stabilized runway shoulders on both sides of the runway extending an additional 15 meters (50 feet) outward from the runway edge.

The significance of this requirement is that the stabilized runway shoulder widths for aircraft approach categories C and D, those built to the Airplane Design Group V standard, measure only of 35 feet (10.5 m) and not 50 feet (15 m). Hence, the Flight Standard Service requirement necessitates a 15-foot (4.5-m) increase. Thus, the required width of runway plus stabilized shoulders is at least 250 feet (76 m).

- Runways as narrow as 45 meters (150 feet) wide without stabilized shoulders as noted above may be used for takeoffs and landings provided applicable flight manual procedures for takeoffs on 45-meter wide runways without stabilized runway

shoulders are followed, and procedures are implemented for the full length of the runway to be inspected for foreign object debris after takeoff prior to successive aircraft operations.

The significance of this requirement is that Flight Standard Service recognizes that airport operators require time to adequately plan for and construct wider stabilized shoulders. Until their completion, pilots will follow specific operational procedures and airport operators will inspect the full runway length after each A380 takeoff for the presence of foreign object debris prior to ensuing aircraft operations.

In summary, runways receiving A380 service must be operated in accordance with one of the above requirements. For either option the airport operator is required to designate the runway(s) that will accommodate A380 operations in the airport's *A380 Operational Plan*. No modification-to-standard (MoS) is required for either case. However, to receive AIP Federal funding or PFC authority for widening stabilized shoulders to 50 feet (15 m), a MoS needs to be filed for approval.

B. PURPOSE

This engineering brief provides airport operators and FAA Airports Regional Offices guidance when airports operators must file a MoS and construction options to address the requirements in paragraph A. New runway construction or major reconstruction, including runway blast pads, that receives Federal funding under the Airport Improvement Program (AIP) or is approved for the use of Passenger Facility Charges (PFC) is subject to Airplane Design Group VI design standards, as specified in *Advisory Circular (AC) 150/5300-13, Airport Design*. In the case of new runway construction or major reconstruction not receiving AIP Federal funding or PFC authority, it is highly recommended that such construction comply with Airplane Design Group VI standards.

Airports Regional Division Managers have the authorization of approving MoSs that meet the conditions of this engineering brief. Issuance of a MoS requires a copy be sent to the Airport Engineering Division, AAS-100.

C. CANCELLATION

Engineering Brief No. 65, *Minimum Requirements to Widen Existing 150-Foot Wide Runways for Airbus A380 Operations*, dated February 13, 2004 is cancelled. The cancellation of EB 65 withdraws the design option for converting existing stabilized shoulders to runway pavement.

D. Filing of a MOS and Construction Options

(1) Existing 150-foot (45-m) wide runways having 35-foot (10.5-m) wide stabilized shoulders. Such runways must be operated in accordance with one of the above requirements from paragraph A. To avoid the full-length runway inspection for the presence of FOD after each A380 takeoff, a 150-foot (45-m) runway must have at least 50-foot (15-m) stabilized shoulders. For either option the airport operator is required to designate the runway(s) that will

accommodate A380 operations in the airport's *A380 Operational Plan*. Existing runway surface markings, signage along the runway, and lighting fixtures are not required to be changed. This subparagraph does not require filing of a MoS except for airport operators desiring to receive AIP Federal funding or PFC authority for widening stabilized shoulders to 50 feet.

(2) Existing 200-foot wide runway with less than a 250-foot (76-m) overall width. Such runways must be operated in accordance with one of the above requirements from paragraph A. To avoid the full-length runway inspection for the presence of foreign object debris after each A380 takeoff, a 200-foot (60-m) runway must have at least 25-foot (7.6-m) stabilized shoulders. For either option the airport operator is required to designate the runway(s) that will accommodate A380 operations in the airport's *A380 Operational Plan*. Existing runway surface markings, signage along the runway, and lighting fixtures are not required to be changed. This configuration does not require filing of a MoS. It is recommended that widened shoulders provide the Airplane Design Group VI design standard of an overall total width of 280 feet (85 m).

(3) New Runway Construction or Reconstruction of 150-foot (45-m) Wide Runways. New runway construction or major reconstruction, including runway blast pads, that receives AIP Federal funding or PFC authority is subject to Airplane Design Group VI design standards including the requirements for runway and stabilized shoulder widths, having an overall total width of 280 feet (85 m), as specified in *AC 150/5300-13* and construction in accordance with *AC 150/5320-6, Airport Pavement Design and Evaluation.* The cancellation of EB 65 withdraws the design option for converting existing stabilized shoulders to runway pavement. Any deviation requires filing of a MoS for any AIP or PFC project that does not meet a design or/and construction standard.

Rick Marinelli
Manager, Airport Engineering Division

Attachment A

Federal Aviation Administration

Memorandum

Date: JUL 17 2007

To: David Bennett, Director, Airport Safety and Standards, AAS-1

From: James J. Ballough, Director, Flight Standards Service, AFS-1 /for/ JJB

Prepared by: Jerry Ostronic, Aviation Safety Inspector, Air Carrier Operations, AFS-200

Subject: Airbus A380 Operations Evaluation Results

The Flight Standardization Board (FSB) completed its operations evaluation of the Airbus A380 on June 14, 2007. In addition to the normal FSB tasking, the evaluation team focused on two unique operational issues, operations on runways as narrow as 45 meters (150 feet) wide and taxiing on taxiways as narrow as 75 feet without taxiway centerline lighting and without the aid of the taxi camera system.

Operations Issue Paper O-9 was developed and issued to Airbus to identify the FAA's concerns for the operation of the A380 on runways narrower than the standard Airplane Design Group-VI criteria of 60 meters (200 feet) wide. Airbus and the FAA agreed to a three-pronged approach to evaluating and demonstrating that the aircraft could be safely operated on runways as narrow as 45 meters. Throughout the development and certification flight program, all runway centerline lateral deviation data were recorded with differential global positioning system for all takeoffs and landings. These data were made available to the FAA team for evaluations. All flight testing for both normal and failure cases was conducted on 45-meter wide runways, or if wider, was considered to be 45 meters for evaluation purposes. Additionally, a subset of A380 takeoff and landing runway centerline lateral deviation data was extracted from the total and compared to pre-existing A330/340 runway centerline lateral runway deviation data obtained under approximately the same configuration, pilot, and meteorological conditions. Finally, subjective evaluations were conducted by the FSB operations evaluation pilots assisted by inputs from FAA certification flight test pilots. These FSB evaluations were supported by subjective reports of the multinational Joint Operations Evaluation Board operations evaluation pilots. In all, 14 pilots took part in the evaluations for the use of 45-meter wide runways. The team found that the A380 could be safely operated on runways as narrow as 45 meters with the use of average pilot skills and knowledge. The following statement will replace the current statement in the FAA Airbus A380 Aircraft Flight Manual for minimum runway width requirements.

> "This aircraft has been shown to be safely controllable and to be compliant with applicable airworthiness requirements when operating on runways with a width of 45 meters (150 feet) or more."

Additionally, the FAA will issue domestic and/or foreign air carriers (operating into the U.S.) operating the A380 Operations Specifications that specify the following:

- Runways for takeoffs and landings shall be at least 45 meters (150 feet) wide with stabilized runway shoulders on both sides of the runway extending an additional 15 meters (50 feet) outward from the runway edge.
- Runways as narrow as 45 meters (150 feet) wide without stabilized shoulders may be used for takeoffs and landings provided applicable flight manual procedures for takeoffs on 45-meter wide runways without stabilized runway shoulders are followed, and procedures are implemented for the full length of the runway to be inspected for foreign object damage after takeoff prior to successive aircraft operations.

As per your request, the team also evaluated the adequacy of 75-feet wide taxiway restrictions contained in engineering briefing 63 (EB63). In particular, the requirement for taxiway centerline lighting for normal operations and the required use of the onboard taxi camera system were evaluated. The team conducted this evaluation under the full range of lighting conditions and found that the aircraft could be safely taxied on 75-feet wide taxiways under normal visibility conditions without taxiway centerline lighting using average pilot skills and knowledge. Likewise, the onboard taxi camera system was found not to be necessary for safe taxi on 75-feet wide taxiways using average pilot skills and knowledge. This finding is also valid for the combined conditions of no taxiway centerline lighting and inoperative onboard taxi camera system under day and night lighting conditions with no other operational requirement for taxiway centerline lighting. Based on the results of this evaluation, the Flight Operations Evaluation Board chairman will allow the taxi camera system to be inoperative in the master minimum equipment list.

End of Memorandum