U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Associate Administrator
for Airports

800 Independence Ave, SW.
Washington, DC 20591

AUG 2 3 2019

The Honorable Ron Johnson
United States Senator
Washington, DC 20510

Dear Senator Johnson:

Thank you for your July 15 transmittal on behalf of Ms. Mary Baeten and Mr. Seward Ford expressing concerns about the Federal Aviation Administration's (FAA) Engineering Brief 83A.

We appreciate the time that Ms. Baeten and Mr. Ford took to outline their concerns, and we will take their input into account as we conduct additional research. We particularly appreciate their concern about ensuring safety, while also being mindful of financial considerations.

Enclosed is a detailed, technical summary prepared by our Airport Engineering Division, which explains the analysis supporting this Engineering Brief. We always encourage interested stakeholders to work with us if they believe there are better solutions. Accordingly, we would encourage Ms. Baeten and Mr. Ford to contact Mr. Khalil Kodsi, P.E., Manager of the Airport Engineering Division, if they would like to discuss any aspect of this further. Mr. Kodsi may be reached by telephone at (202) 267-7669 or by email at khalil.kodsi@faa.gov.

The FAA anticipates conducting additional research on these issues in coordination with multiple industry stakeholders.

If you or your staff need further assistance, please contact Philip Newman, Assistance Administrator for Government and Industry Affairs, at (202) 267-3277.

Sincerely,

D. Kirk Shaffer
Associate Administrator
for Airports

Enclosures
Engineering Brief Technical Summary
Transmitted Correspondence

Summary of Technical Basis for Federal Aviation Administration Engineering Brief 83A

The Federal Aviation Administration (FAA) conducted extensive tests that led to the development of Engineering Brief (EB) 83A. Many variables go into the calculation of the clamping force necessary to resist the shear forces generated by new aircraft. The FAA considered the uncertainty of each variable reaching assumed values. EB 83A is a comprehensive approach at updating connection requirements for runway centerline lights. The value of slip coefficient of friction of 0.37 and the calculation of clamping force was dependent on all of the following factors:

1. Maximum gross takeoff weight – At best, only half the operations would have this occur and even those may not depart with a full fuel load;
2. Coefficient of friction between aircraft tire and light of 0.80 given by industry;
3. Maximum braking force of the aircraft while main gear tires are in contact with centerline lights – full load would require a locked wheel acting on the light;
4. The presence of antilock brakes on aircraft would minimize the sustained loading on the light; and
5. The probability of a main gear tire is indicated by a coverage/pass (c/p) ratio of about 0.05, which indicates that for every 100 operations there would be 5 instances where the tire may roll over the light (measure of aircraft wander).

The probability of all five above occurring simultaneously is minimal. Therefore, the FAA felt justified raising the slip coefficient of the faying surfaces to be adequate at 0.37 for the following reasons:

- The presence of antilock brakes where the braking force is applied for maybe a fraction of a second;
- Every 2 months, bolt torque check requirement inspections would tend to monitor performance; and
- Over time, corrosion tends to raise the coefficient of friction.

The FAA believes that utilizing maximum values would negate the above considerations and make the design overly conservative.

As per utilizing American Association of State Highway and Transportation Officials (AASHTO) and their requirement for mating surface characteristics, AASHTO based its testing method on the Specification of Structural Joints Using High-Strength Bolts publication. The Research Council on Structural Connections prepared this publication and the testing method is quite extensive. The AASHTO specification is for the design of slip-critical joints that considers sustained loading in critical steel structures.

Requiring "base can" vendors and "light" manufactures to modify their manufacturing process to meet friction coefficient requirements is costly. Modifying manufacturer's process, based on research, may apply for installations with new specifications. However, the use of stronger bolts is a cost-efficient manner to provide for a safer connection to existing installations.

The FAA is proposing additional research to explore the appropriate surface friction measuring standards per the American Society of Testing Materials (ASTM) International. In addition, the FAA is looking into the utilization of friction coated (or treated) spacer rings to enable a more efficient connection.