Michael Meyers
Airport Safety & Standards
Airport Engineering Division
800 Independence Avenue, SW
Washington, DC 20591

December 09, 2020

Good day:

Congratulations on your appointment as manager for AAS-100.

I am writing in regards to Engineering Brief 83A and the ongoing confusion and lack of credibility regarding the assumption of .370 as the slip coefficient of the galvanized faying surfaces in the light base/light fixture stack As you can see from the list below, this is well above the FAA's own test results as well as industry standards.

FAA EB 83A galvanized faying surfaces assumed	.370
FAA testing results (3 spacers) average	.144
RCSC galvanized faying surfaces minimum	.300
FHWA galvanized faying surfaces minimum	.300
ASTM A325 galvanized faying surfaces	.190

In EB 83A the FAA uses the Airbus 380-800 landing/braking forces as the worst case situation. The assumption of .370 as the slip coefficient is based on using the SAE J429 Grade 5 bolt. This combination just barely creates the necessary clamp force required to offset the landing/braking forces specified in EB 83A. In fact, if the assumption is only .363, this combination fails. The correct solution should require faying surfaces that when tested will allow the horizontal thrust forces to be absorbed by the spacer rings surface friction and not by the less reliable method of relying on bolt clamping force. Using the suggested method will allow an appropriate slip coefficient to be specified in Base AC 150/5345-42 guaranteeing uniformity of slip coefficient for all bases and spacer rings, regardless of manufacturer. If one relies primarily on a particular bolt clamping force the clamping force most likely will not be properly maintained for the life of the base installation. In today's maintenance of in pavement fixtures it is quite likely that replacement bolts matching the originally installed bolts **will not** be utilized. Maintaining the light/base connection ability to resist the horizontal forces is more assured when the friction between faying surfaces is maintained as delivered from the manufacturer with less reliance on bolt properties which are harder to maintain.

You can note from above, the FAA's testing averages at .144, that it seems implausible to have EB 83A use .370 as their assumption. How was the assumed slip coefficient determined? Please show me the calculation path.

I wrote to Mr. Kahlil Kodsi regarding this, and received the letter attached. In short, "The probability of an aircraft tire generating full brake torque, while being directly located on a light fixture, is an extreme condition, and is applied for a very short time duration based on aircraft speed. If the maximum load is applied for a fraction of a second, at a lower friction value, we doubt there will be an issue." These same conditions would apply to any bolt so why the insistence on using the Grade 5 bolt? As indicated above the ultimate solution is raising the slip coefficient of the faying surfaces to a level at which today's common bolts can be utilized to meet the environmental conditions present. Please note the following pertinent remarks with regard to the path ahead.

EB 83A states that in the past 18-8 bolts were specified and resulted in very few problems. Using the above logic, why not allow F593C (18-8) bolts as well?

EB 83A was published December 26, 2018. The airport lighting community was repeatedly told that the FAA was going to test various coatings for increased friction. To date, there has been no further information on testing dates. MCB Industries, Inc. tested a coating (RCSC Class D) at Intertek that resulted in μ=.64 and increased the horizontal resisting force to 14,500 lbs. In fact, if the FAA would use the same standards as required for federal funding on highway projects (as well as the standards set by the RCSC) we would increase the friction considerably and therefore reduce the critical dependence on the bolts to keep the bolted joint together.
Surely the FAA did not intend an engineering brief to require an airport to be compliant with a failing bolted joint.

EB 83A was published December 26, 2018. In the subsequent meetings, the FAA was scheduling further testing on the slip coefficient. Has that testing occurred? If not, when will it be scheduled?

In the meantime, EB 83A is a disservice to the airport lighting community. It limits an airports options without solving any of the bolted joint problems.

When would it be possible to discuss this in detail?

Regards,

Mary Baeten
President

(Enclosed 3)

Letter to Kahlil Kadsi
Response from Kahlil Kadsi
Intertek Test Report: 103473607CRT-001