



September 4, 2009

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Re: Comments—Draft Advisory Circular 150/5220-xx, *Airport Foreign Object Debris/Damage (FOD) Detection Equipment*

Airports Council International-North America (ACI-NA) is pleased to provide the Federal Aviation Administration (FAA) with comments regarding the draft Advisory Circular (AC) 150/5220-xx, *Airport Foreign Object Debris/Damage (FOD) Detection Equipment*. As you know, ACI-NA is an organization composed of state, local, and regional government entities that own and operate commercial service airports in the United States and Canada. ACI-NA member airports enplane more than 95 percent of the domestic scheduled air passenger and cargo traffic and virtually all scheduled international air traffic in North America. Nearly 400 aviation-related businesses are also members of ACI-NA.

We appreciate the FAA's efforts to provide the industry with guidance regarding FOD detection systems, a critical step towards making such systems eligible for funding under the Airport Improvement Program (AIP). We recognize that to provide guidance to airports as expeditiously as possible, the AC has been structured around the capabilities and specifications of four major FOD detection systems commercially available today. However, in the future, we believe that it would be useful to restructure the AC in a more generic fashion so that the AC will not require updates or lengthy addenda when new FOD detection systems are introduced. This comment applies primarily to the descriptions of system characteristics and performance that appear in Sections 3.1, 3.2, and 3.3 of the draft AC.

We also want to emphasize our belief that supplemental high resolution video capabilities for stationary and mobile radar systems should be AIP eligible if such capabilities are identified by airport operators as necessary to their FOD detection program. As you know, these capabilities can speed the identification of detected

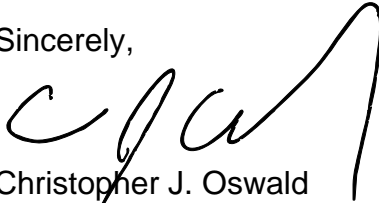
objects and can be used to make better decisions regarding how airport operations personnel should to respond to them.

Our more detailed comments appear in the table that follows this letter.

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Again, we appreciate the opportunity to comment on the draft AC. Please contact me at (202) 293-8500 if you have any questions regarding our comments.

Sincerely,



Christopher J. Oswald
Vice President for Safety and Technical Operations
Airports Council International-North America

**COMMENTS—DRAFT ADVISORY CIRCULAR 150/5220-XX,
STANDARDS FOR AIRPORT MARKINGS**

Submitted by Airports Council International-North America

#	Paragraph	Page	Comment
1	Application paragraph	i	<p>The draft AC focuses on three FOD detection sensors (excluding the human eye). The AC should include language that provides flexibility for emerging technologies. Flexibility should also be provided for system configuration, specifically the incorporation of video FOD identification and verification capabilities.</p> <p>The advisory circular outlines data recording (presentation and management) requirements on detected FOD with a permanent/digital recording "not subject to post-processing modification." This will require some type of a secure database (best incorporated into an SMS incident data management system). It will be important for airports to clearly understand the database security requirements.</p> <p>Installation of such equipment will also require training and maintenance (addressed on last page of AC). Need to ensure initial equipment training costs are included if federal grant monies are used. For example, stationary radar and stationary electro-optic options are to be located up to 820 feet from runway centerline with several sensors to cover the runway. This could have a tremendous impact on mowing of the AOA. Mowing around the sensors and keeping the grass below the sensor line of sight would be a continuous challenge operationally and potentially increase the cost to maintain the airfield by increasing mowing activity. Another example involves the stationary hybrid system, which would be "collocated" with runway edge lighting and could have an impact on maintenance of runway edge lighting systems.</p> <p>The advisory circular provides only generic details of system selection criteria, with a reference to number of operations and runway lengths. It may be beneficial to provide guidance requirements based on large, medium and small airport operations.</p> <p>Providing power to the sensors would likely require installation of a separate source of power on the airfield with associated increased maintenance requirements.</p> <p>While the circular addresses the general specifications of FOD detection equipment, it doesn't fully define and prioritize the coverage area these devices must cover. For example, will 100% coverage of paved areas used by aircraft be required, including ramps? If all areas are not covered, what is the priority (assumption is, runways first?). Should there be a differentiation between movement and non-movement areas. It will be important to add language that clarifies what areas must be covered (Runway surface, Runway Safety Area, etc.)</p>

#	Paragraph	Page	Comment
1 (cnt'd)	Application paragraph	i	<p>The circular includes wildlife under the category of "natural materials" FOD. Should any of this equipment have the ability to detect animals on the runway as a required specification?</p> <p>Equipment located in the turf off of paved surfaces should be designed and built with maintenance in mind. For example, a device should be mounted on concrete pads which serve as mow strips, no exposed cables etc. If done, the impact to maintenance operations will be minimal.</p>
2	1.1.j	1	<p>Recommend deleting the term "visual light wavelength (in the visible band, and in some cases the near-infra-red band)" and replacing it with "visual and infra-red wavelengths and image processing". Doing so simplifies the definition and ensures that these sensors are distinguished from simple video systems (e.g., closed-circuit television) that lack image processing capabilities.</p>
3	1.1.l	1	<p>From my read of the rest of the draft AC, it appears that the acronym "FOD" is only used to refer to foreign object debris. Accordingly, for purposes of this AC we recommend using FOD to refer only to debris and not to damage.</p>
4	1.1.r	2	<p>The definition is confusing. First a 4.75" metallic sphere is established as a reference object, then it is noted that a 1.2" high x 1.5" diameter object is commonly used as a reference object. Are both acceptable? Moreover, no material is specified for the cylindrical reference object. Should it be specified as metallic as well? Also, from our read of later sections of the draft AC, it appears that the sphere is to be used for calibration/validation of stationary and mobile radar systems, whereas the cylinder might be used for calibration/validation of stationary electro-optical and stationary hybrid systems. Please clarify. Also, if the cylinder is used primarily for the calibration/validation of electro-optical and hybrid systems, it calls into question whether such an object really belongs under the definition of the term "radar reflectivity".</p> <p>As noted in later comments as well, we recommend deleting this definition and providing descriptions of these objects directly and explicitly in sections of the AC that deal with FOD detection system performance requirements.</p>
5	1.1.t	2	<p>The term "risk" does not appear to be used elsewhere in the draft AC. Recommend deleting this definition.</p>
6	1.1.u	2	<p>Is two year storm data readily available, or will airports have to peruse weather data to establish the two year storm intensity. Why not just specify the rainfall intensity that the systems must withstand in inches of rainfall per hour?</p>

#	Paragraph	Page	Comment
7	1.2	2	See Comment 3 above regarding use of the acronym "FOD"
8	3.1.c (1)		The paragraph initially states that there are "a wide range of price and performance opportunities" available for FOD detection system, whereas at the end of the paragraph only "two general designs" are mentioned. These appear to be inconsistent statements.
9	3.1.c (2)	7-8	<p>As a general comment regarding the "System Characteristics and Operation" section, much of this section is overly specific, representing the characteristics of specific vendor systems. Because they appear in an AC, these vendor-specific characteristics are likely to be interpreted as hard-and-fast requirements for AIP-eligible FOD detection systems even though this may not be the intent of including them in the AC. Examples of such characteristics include (1) the number of sensors associated with a system, (2) sensor detection sensitivity and range, (3) scan frequency, and (4) typical sensor setbacks from runway and taxiway centerlines.</p> <p>We recommend rewriting the system descriptions included under Paragraph 3.1.c (2) to provide more generic descriptions of system characteristics, eliminating potentially installation-specific details such as sensor setbacks, detection sensitivity and rates, radar frequencies, and the like. For example stationary radar systems could be described as "a system that relies on a set of stationary radar sensors mounted on towers". Such an approach will eliminate the need to frequently update these paragraphs as new systems come to market and avoid the potential for characteristics defined in this section to be interpreted as hard-and-fast system requirements.</p>
10	3.1.c (2)	7-8	<p>If text regarding specific technical characteristics of the four existing FOD detection systems is retained (i.e., if Comment 9 above is not adopted), we strongly recommend that the text in these sections reflect a common characteristics, facilitating easy system comparison, and rely on similar text to eliminate potential confusion.</p> <p>For example, scan time/frequency is currently only mentioned with respect to stationary hybrid systems, begging the question "What are the scan times of the other systems?" Similarly, the use of video systems to aid in FOD identification and risk assessment is only noted with respect to stationary radar, although such capabilities are inherent or available supplements to the three other types of systems. Another key discrepancy lies in the apparently arbitrary use of the verbs "can" and "will" when referring to detection sensitivity.</p>

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11	3.1.c (2)(a), 3.1.c (2)(d)	7-8	If text regarding specific technical characteristics of the four existing FOD detection systems is retained (i.e., if Comment 9 above is not adopted), we strongly recommend replacing the radar reflectivity requirement referenced in these two paragraphs (-20dBm^2) with an object specification (a 4.75" diameter metallic sphere).
12	3.1.c (2)(a) 3.1.c (2)(c) 3.1.c (2)(d)	7	The specification of the radar wavelength seems overly focused on the characteristics of existing systems and could limit the applicability of the AC to future systems that may rely on different wavelengths. Does the wavelength of the radar system really need to be specified here?
13	3.1.c (2)(d)	8	Recommend noting that mobile radar systems differ from the other systems in that they cannot provide continuous scanning capability.
14	3.1.e (1)	8	The introductory paragraph is confusing. Please reword. For example: "Atmospheric conditions, lighting, and sensor placement and sensor configuration all can affect the performance of FOD detection systems. The following paragraphs summarize how various FOD detection systems are affected by these factors."
15	3.2.a (2)	8	Recommend adding the phrase "based on the airport's FOD management plan" at the end of this sentence so that it is clear FOD detection systems only need to detect FOD in the area that they are designated to cover, not the entire AOA. Ideally, this paragraph—or the referenced FOD management plan—should specify the size and characteristics of the objects that the FOD detection system must be able to detect within their designated coverage area.
16	3.2.b (2)	9	Guidance should be provided regarding how frequently system calibration activities need to be performed. Also, the specification of system specific calibration objects seems at odds with the goal of procuring a FOD detection system, namely to detect objects that pose a hazard to flight operations at an airport. Accordingly, we recommend use of a standardized calibration object or set of calibration objects specified by the FAA (i.e., there should be a common minimum object detection standard for AIP-eligible FOD detection systems, not four different standards). As noted in earlier comments, the radar reflectivity specification should be replaced by an object specification (4.75" diameter metallic sphere).
17	3.2.b (6) 3.2.b (7) 3.2.b (8)	10-11	There are several references to "as specified by the user" with respect to detection systems. Can more specific details be provided?

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18	3.2.c (1) (b) 3.2.c (1) (e)	12	Neither FOD descriptions nor the times of FOD retrieval will be automatically entered into a FOD data log by FOD detection systems. Rather, these data fields would need to be entered manually by airport operations staff. Depending on the sensitivity of the FOD detection system and the airfield area it covers, the staff time and costs associated with manually entering such information could be substantial and act as a potential deterrent to installing a FOD detection system.
19	3.2.c (1)(f)(iii) 3.2.c (1)(f)(iv) 3.2.c (1)(f)(v)	12	For each of these data fields (airport operations data, weather data, flight schedules), it is unclear what data would need to be entered. For example, for weather data, what weather data elements are needed? What is meant by “airport operations data” and “flight schedules”? The lack of definitions of these terms make it highly likely that (1) these data will be inconsistently defined from site to site and (2) there will be a potentially significant and costly manual data entry effort required to supply these data.
20	3.2.3	12	As noted in Comment 1 above, the requirement to “permanently” record FOD data, which we read in this paragraph to mean “permanently retain” such data, will be a significant deterrent to the installation of FOD detection systems at airports. Securely maintaining such data will likely be costly and carries with it potential liability issues that the AC does not address. Also, it is unclear to us how this requirement is relevant to data collected by mobile (i.e., non-continuous) radar systems. We object to this data recording requirement and request its deletion from the AC.
21	3.3	12-16	Section 3.3 of the document reads like a specification for purchase, installation and maintenance of FOD sensors and it appears to have been extracted from materials produced by current manufacturers of these sensors. As noted in the cover letter attached to these comments, we understand this may have been done to expedite publication of the AC. However, in future versions of the AC it would be useful to have a set of standards pertinent to a broad range of existing and future technologies, rather than specific, currently-available systems.
22	3.3.a (1)(b)	13	We note that the “total life” associated with mobile radar systems presumed that such systems are only used for one airport inspection per day. Is this assumption realistic, given that many larger airports conduct airfield inspections more than once a day?

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23	3.3.a (2)(a)(i)	13	The maximum ambient temperature is specified as 123 degrees Fahrenheit. The ambient temperatures near airfield pavements exceed this level during the summer months at several US airports (e.g., DFW, PHX, LAS), rising to 140 degrees Fahrenheit or more. Would it be possible to increase this temperature or specify it in relationship to observed ambient temperatures at an airport?