24 March, 1999

From: Commander, Naval Facilities Engineering Command (NAVFAC Criteria Office)
To: Distribution

Subj: INTERIM TECHNICAL GUIDANCE (ITG)-SKID RESISTANCE CRITERIA FOR AIRFIELD PAVEMENTS

Ref: (a) Design Manual 21.9 "Skid Resistant Runway Surfaces"
(b) FAA circular AC 150/5320-12C, "Measurement, Construction and Maintenance of Skid-Resistant Airport Pavement Surfaces"

Encl: (1) Navy Unique Airfield Skid Resistant Airfield Pavement Evaluation Requirements

1. **Purpose:** The purpose of this guidance is to advise facility engineers, planners, and maintenance personnel of the Naval Facilities Engineering Command (NAVFAC) adoption of FAA circular AC 150/5320-12C. Use this criteria for specific guidance on determining runway surface friction characteristics, procedures and equipment for measuring surface friction, and maintaining of skid resistant surfaces. This document may be downloaded off the internet from the FAA's Advisory Circular website at www.faa.gov/ARP/150ACS.HTM.

2. **Background**: Braking performance is critical for all aircraft, especially on wet runway surfaces. For military aircraft carrying ordnance, it is even more critical. Presently the Navy uses ref (a) for its basic runway skid resistance evaluation program. This document is outdated (December 1981) and utilizes a method in which the runway pavement is flooded to simulate a rainfall event. Modern equipment used to determine frictional response employees a self watering system, which applies a predetermined amount of water in front of the measuring wheel. Public Law 104-113, the national Technology Transfer Act of 1995, requires the Navy to adopt voluntary consensus standards whenever possible. In adherence to this public law and in recognition of the applicability of this criteria to the Navy's pavements, ref (b) has been adopted.

3. **Discussion:** The FAA is recognized as a leader in the development of frictional response criteria and is heavily involved in the evaluation and approval of new equipment and products for use on airfield pavements. The FAA in conjunction with other DOD activities has recently sponsored a thorough evaluation of runway skid resistance measurement procedures and equipment commercially available. The FAA continues to monitor and test new equipment and products for use on airfield pavements.

4. **Criteria:** Ref (a) criteria are hereby inactive for evaluation of airfield skid resistance criteria, and is superceded by reference (b). For the evaluation of airfield runway surfaces, addresses should ensure that skid resistance runway evaluations are done in accordance with ref (b). Navy unique skid resistance evaluation requirements are provided by encl (1), in addition to ref (b) requirements.

5. **Coordination:** The NAVFAC Criteria office coordinated this document with the geotechnical and pavements evaluation branches at each EFD/EFA/PWC and the NFESC. Comments on the use of this guidance should be made to the POC before 1 Jan 1999. At such time the ITG will be converted into mandatory direction.

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NAVY UNIQUE AIRFIELD SKID RESISTANT AIRFIELD PAVEMENT EVALUATION REQUIREMENTS:

Hot Mixed Asphalt Pavement "HMA"

The guidelines set forth in Section 2 of ref (b) are acceptable for use on naval airfield pavements with the exception of the following:

1. Chip seals and slurry seal coats shall not be used to increase the skid resistance on asphalt runway pavements. In the past these items have proven to be high producers of foreign object debris "FOD" and as such have been typically unacceptable to airfield managers.

2. Porous Friction Courses (PFC) have proven to be useful in removing surface water from runway surfaces, however, their effectiveness is highly dependent on a quality design and construction and they may be very expensive to construct.

Portland Cement Concrete Pavement (PCC)

The guidelines set forth in Section 3 of ref (b) are acceptable for use on naval airfield pavements with the exception of the following:

1. The preferred finish for PCC airfield pavements is either a broom or burlap drag finish. The use of wire combing or tining is not recommended due to the potential for "tearing" of the surface resulting in a high potential for foreign object debris "FOD". Due to the nature of military aircraft, i.e., the intake of many of these aircraft are closer to the ground, what is acceptable on a commercial airfield may not be acceptable on a military airfield.

Runway Grooving

The guidelines set forth in Section 4 of ref (b) are acceptable for use with the following comments:

1. Saw cutting of the finished PCC or HMA pavement is the preferred method of producing grooved pavement. Other methods utilizing plastic grooving should only be used after the contractor has demonstrated his ability to provide grooves without tearing or shearing of the pavement surface.

Skid Resistance Evaluation

NAVFAC, through the Engineering Field Divisions, will perform friction measurement evaluations, utilizing continuous friction measuring equipment (CFME), on naval airfields on an "as requested" basis by the airfield operator or manager. The airfield operator or manager is responsible for monitoring the build-up of rubber and ensuring its removal when a hazard exists.

Maintaining High Skid-Resistance

In the past, skid resistance evaluations on a four-year cycle were used in determining when skid resistance of the pavement structure was approaching minimal values. Funding shortfalls prohibit the continuation of this practice. However, the most prevalent forms of hydroplaning potential for naval airfields occur in areas where rubber has built up or where ponding of water exists. Unfortunately, these evaluations provide little assistance in locating and evaluating these areas.

1. The airfield operator or manager should undertake a program to locate and assess hydroplaning potential for areas, which hold water after a rainfall. Those areas that present a hazard to landing aircraft should be repaired as soon as possible.

2. The airfield operator or manager should continually monitor the presence of rubber build up in the touch-down areas. Removal of rubber shall be at his discretion. Ref (b) discusses several methods for removing contaminants. All of these methods are acceptable provided they do not present an environmental concern nor damage the pavement surface. Also, the NAVFAC pavement evaluation teams will visually monitor the presence of rubber build up when periodic pavement evaluation surveys are conducted.