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Tony Gerardi Airfield Pavement Practitioner Award Nomination.

I, Frank V. Hermann, nominate Tony Gerardi for the Airfield Pavement Practitioner Award. I have known Tony for over 30 years, and he has played a significant part in my professional life. I met him many years ago at the ASCE Airport Committee meetings and ASCE Airport Pavement meetings and am among those instrumental in encouraging his work on airfield pavement smoothness. Throughout this nomination I will refer to these and successor committees as the Airport Pavement Committee.

It is known that the Wright Brothers selected Kitty Hawk for their first flight because of the steady winds, but the visually smooth surface may have played a role. While smoothness may or may not have been a factor in their site choice, what is known is that at some point runway roughness was a recognized problem. At the June 4, 1996 meeting of the American Society of Civil Engineers, Air Transport Division, Airport Pavement Committee, a new Task Force Committee was established with Tony Gerardi as its first Chairman. The following is the text from the minutes of that meeting.

> *"Airport Pavement Ride Quality: Mr. Tony Gerardi is the Chairman of this new task Committee, which was formed based on discussions in a meeting of the Design and Evaluation Subcommittee at the Transportation Congress in San Diego. He pulled together some case histories to justify the need for establishing a ride quality roughness criteria and discussed these cases. The current FAA criteria for smoothness are based on a 16-foot straightedge for concrete and a 10-foot straightedge for asphalt. Military Specification 8862A gives a criteria for maximum gear loads due to roughness. ICAO would like to have a roughness criteria. The task committee would like to establish ASTM standards for ride quality / smoothness criteria. The FAA is currently studying roughness criteria for new construction. Chair Foxworthy indicated that anyone wishing to participate in the task committee should contact Mr. Gerardi."*

My lifetime concern for airfield pavement smoothness began around 1970 during the design and construction of the Honolulu Reef Runway. It is 12,000 feet long precisely at elevation 10 feet. Our field inspector had worked in Vietnam and was aware that rough runways shook bombs off departing aircraft. He and the contractor wanted guidance on how far this profile could deviate from the precisely flat straight line. There was no guidance beyond the simple FAA specification noted above. Working together we established guidance that could be used on this specific project.

Shortly thereafter I began work on Micronesian island airfields that were extremely rough. I also joined the ASCE Air Transport Division including the Airport Pavement Technical Committee including the various subcommittees. Around this time met Tony who gave me guidance based on his knowledge and experience. I had a desire to have him measure these runways and he designed his equipment to be transported to these remote islands. I was never able to get my clients to engage him, but he was, and still is, a major influence on my work.

Tony attended almost all ASCE Airport Pavement Committee meetings from the mid 1980's. He made presentations at all committee meetings. He emphasized how critical airport pavement smoothness is to the safe operation of aircraft. Committee members became aware of smoothness, but other than his constant reminding relatively little was understood of what was and was not a "smooth" pavement. Its importance was only minimally recognized.

Tony made a presentation in 1994 or 1995 which was a major step forward. He demonstrated how an uncomfortable bump near the start of a normal departure could potentially damage or destroy an aircraft during an abort in the opposite direction. Tony had just completed the equations of motion needed to simulate an aborted (rejected) takeoff. This rejected takeoff simulation was soon applied in a runway evaluation for an airport on the east coast of the US. These new equations predicted a significant response that could result in structural damage to the aircraft resulting from an aborted takeoff. We never really appreciated the effect of runway roughness in an aborted takeoff scenario before we had the capability to do the simulations. Once we saw these responses, we became aware of the safety implications of this scenario and Tony felt the immediate need to inform the industry.

Of significance to this nomination, Tony went far beyond making a simpe report. At that meeting and at other meetings and events he pointed out that the problem with encountering roughness during an aborted takeoff gets complicated.

1) The aircraft is at its heaviest with a full load of fuel.
2) During the takeoff, something out of the ordinary precipitates the abort.
3) The pilot applies maximum braking and reverse thrust to the aircraft to complete the abort operation.
4) All of the aircraft's inertia is placed on the aircraft's nose gear. This action compresses the strut and nose wheel resulting in little to no shock absorption left to dampen out roughness.
5) If significant roughness is encountered (as was the potential for ORF), it is possible that the only thing left to absorb the aircraft's response would have been landing gear structure (drag-brace strut etc.)
6) Breaking these structures could lead to loss of steering control or potentially a gear collapse.

Tony showed how the study of a runway's vertical alignment could be entered into a computer simulation and the information used to correct problem areas. Tony brought his equipment to ASCE Airport Committee meetings and displayed how it worked. Year after year he presented more information and kept us aware of the importance of pavement smoothness for the safe operation of aircraft. This ultimately led to the formation of the ride quality task committee. The work of this committee and the constant pressure from Tony led to the FAA, U.S. Airforce and other agencies making studies, establishing guidelines and promoting an understanding that roughness is an important factor in safety and comfort.

While doing research for this nomination I found an envelope from Tony sent October 18, 1993 containing a 3 1/4" diskette titled "TAKE-OFF Demonstration Disk". It illustrated how to use runway profile data to measure runway smoothness. The letter contains information on program developments underway. This program, when used with accurate field data, has resulted in a broad understanding of smoothness (or roughness) and how problems can be addressed.

Although Tony has only attended a few Airport Pavement Committee meetings in the last few years, his son, Michael Gerardi, has attended meetings and has made sure that ride quality is still a significant item of discussion. Tony's lifetime of work is still actively being addressed in our meetings to this date. He is deserving of the Airfield Pavement Practitioner Award.

Respectfully Submitted

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M. ASCE