Runway safety –
Concerto for ATCO and orchestra

By Maciej Szczukowski

Ever since I remember, classical music has accompanied me in my life. Apart from listening to it, I keep on trying to understand it better, on different levels. What I find fascinating is the act of conducting. One day I saw a movie of Maestro Ricardo Muti's master class. As he was conducting Dvorak's Symphony No. 5, he suddenly stopped and said, in his adorable Italian English and in the exact, following words: "more and more I believe less in what conductors can do". That is how I feel about ATCOs sometimes.

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Environmental performance: a necessity (cont'd)

When a conductor begins to work with a new orchestra, he does not know the musical background of each and every musician. Musicians' 'form' and mood are also unknown. Therefore the conductor assumes that all artists are well trained, that they are able to play in the right key and at the required tempo and that they have the technique and empathy to perform a piece of music in exactly the way the conductor would like them to. And, that together, all of them will be able to share the same vision of the music. The problem arises when the conductor assumes wrongly.

A few months ago an air traffic conductor (let's call him that way for a change) had a tough hour on TWR position. It was snowing, the visibility was limited, the wind was strong and gusty, limiting the number of available runway configurations. There were a significant number of inbounds, all looking for a good landing on a clean runway. The snow removal vehicles were waiting for clearance to enter the runway but the traffic load impelled the "conductor" to make them wait. Other vehicles were clearing the rapid exit taxiways of the other, crossing runway to prevent them from icing. They were in different spots (some of them close to runways intersection) and the "conductor" was not able to check on them constantly. The supervisor was coordinating delays with approach controller, asking the "conductor" for his opinion from time to time. The quality of radio communication with the vehicle drivers was poor and so was their phraseology. Trying to work in these difficult circumstances, the "conductor" assumed that one of the vehicles would clear the last rapid exit taxiways in exactly the same manner as all the previous ones. There-

fore hearing the driver asking for the clearance he just said "approved" to the assistant (who was operating the communication system), happy to get some extra seconds for another coordination waiting in line. Two minutes later he realised that the vehicle had crossed the stop bar and the runway without a clearance. A few hours later he found out that the driver had also assumed something – he had thought that if he had no problem getting clearance to enter the runway from all the previous taxiways (which were not equipped with stop bars) then there was no reason to believe that it would be different in the case of the last one.

> Some time ago I had an opportunity to read a whole lot of runway incursion reports. All of them contained a number of recommendations. How many of them (and how quickly) were implemented? That I don't know.
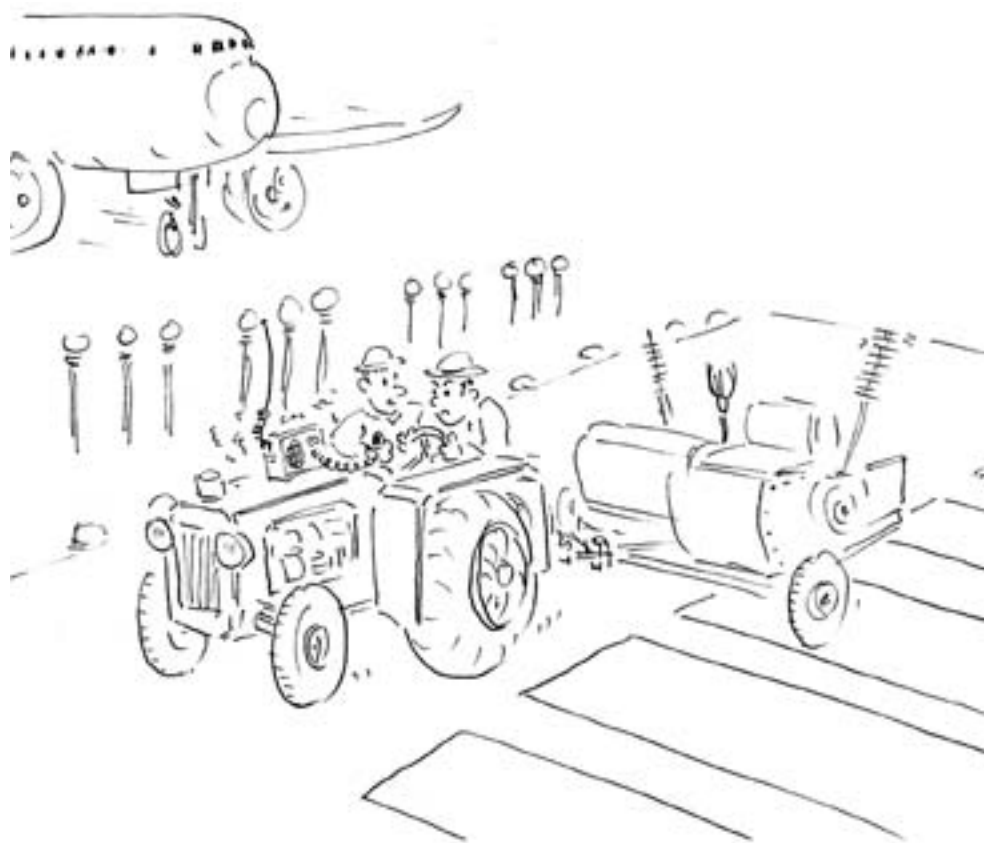
What makes this particular case a special one for me, is the fact that ... I was the "conductor". I did a lot of thinking about this incursion. I thought about available equipment, team resource management, human factors, training quality, my fatigue. And then I thought that maybe we, air traffic controllers, represent an incorrect approach to the whole problem of runway incursions?

For many years now we have had a basic standardised system. Airport maps, runway, taxiway and holding point markings and lights, stop bars etc. Yet runway incursions still occur. Just like in music, where a score printed in the same way will almost invariably lead to almost every performance being different. Because of such uncertainty it is the very basic task of the conductor and the musicians to establish the most mutually satisfying vision of their common performance. And so it is the role of ATC to understand the needs and draw the right conclusions. How?

Some time ago I had an opportunity to read a whole lot of runway incursion reports. All of them contained a number of recommendations. How many of them (and how quickly) were implemented? That I don't know. Many required investments (A-SMGCS or stop bar installation), creation of new procedures (some of which would probably lead to an increased number of actions or rules an ATCO would have to follow) or even serious changes in airport design. Some ideas were expensive. I am not sure how many were practical. One could introduce a double read-back before entering any runway – just like conductors, who make an extra hand move to indicate the exact moment a musician should start playing, just to be sure that there will be no mistake. Or one could designate airport hot spots on every intersection or publish NOTAMs about any known risk at the airport – just like conductors who make notes in their scores and in places which their orchestra seems to find difficult or demanding. One may try to accommodate at least part of such information in ATIS. But it is very likely that doing this would quickly lead to exceeding the recommended duration of 30 seconds[1].

1- ICAO Annex 11, Chapter 4.

He was babbling something about "vacating" and "07:58"...
It is just few minutes past eight and we have finished our work so I don't understand the fuss...

So I decided to take a quick look at runway safety-related NOTAMs[2]. A few days ago I checked the total number along with number and contents of such NOTAMs for 33 different European airports. The percentage of runway safety-related NOTAMs, out of the total number of NOTAMs for these airports, varied between zero and almost 40 %. Among airports with more than 15 NOTAMs active, two of them had 7 and 9 runway safety-related NOTAMs active out of, respectively, 47 and 69 (!) in total. Two thoughts came to my mind after these findings. First – if 40 % of NOTAMs were runway safety related then ATCOs might expect crews to remember them all. Second, and more important – it would be easy to overlook a single, runway safety-related NOTAM, "hidden" among over 60 other messages also required to be reviewed during preflight briefing and if appropriate reviewed during a departure or approach briefing. So I checked the average and maximum number of words in those NOTAMs. The numbers were 20 and 75 respectively. Bearing in mind that the average reading rate, for comprehension, can be 200 words per minute[3], over 22 seconds would be required just to read the longest one. Time to discuss significant NOTAMs with the other pilot is not included here. My conclusion? Wise are the words of Ludwig Wittgenstein, a philosopher who opined that "what can be said at all can be said clearly, and what we cannot talk about we must pass over in silence". Airport authorities or ANSPs/ATCOs should ensure that they create NOTAMs only when they have a real relevance to the "Airmen" they are supposed to help and that they create them only with maximum clarity and brevity. And they should remember,

in this connection, that a picture can save a lot of words.

I believe that runway safety is actually about the proactive flow of information whether in the form of an internal note, a NOTAM or through radio communication. At the operational level, when ATCOs decide to clear a vehicle onto the runway, even though they can't see it, its radio seems to be broken and its driver demonstrates lack of familiarity with the taxiway and runway layout, then it may be too late. I think that nobody should demand more than an ATCO can handle so I see no reason not to openly restrict such driver from entering the area. Still I believe that it is crucial to express, afterwards, the reasons for such decision. Otherwise certain external pressures may arise,

the driver (if, however, cleared to enter the area and focused to do the job by all means) may "hear" a clearance an ATCO has never actually articulated.

Cross training, efficient data exchange, coordinated manuals are, in some places, still ideas far too complex or expensive to invest in. Verification of the quality of airport's ground personnel training is limited, especially in places where it's outsourced. But assertiveness along with understanding is available at all times. Maestro Muti said: "more and more I conduct, more I try to understand music and less I understand the act of waving my baton". I say: look at Your airport, talk, watch and listen. Try to learn and understand Your orchestra. Tell them more about Yourself. Then decide wisely and conduct the concert at Your best and with an understanding of Your 'audience'. ⌇

2- Via FAA NOTAM Retrieval, see https://pilotweb.nas.faa.gov/PilotWeb/
3- http://en.wikipedia.org/wiki/Reading_(activity)