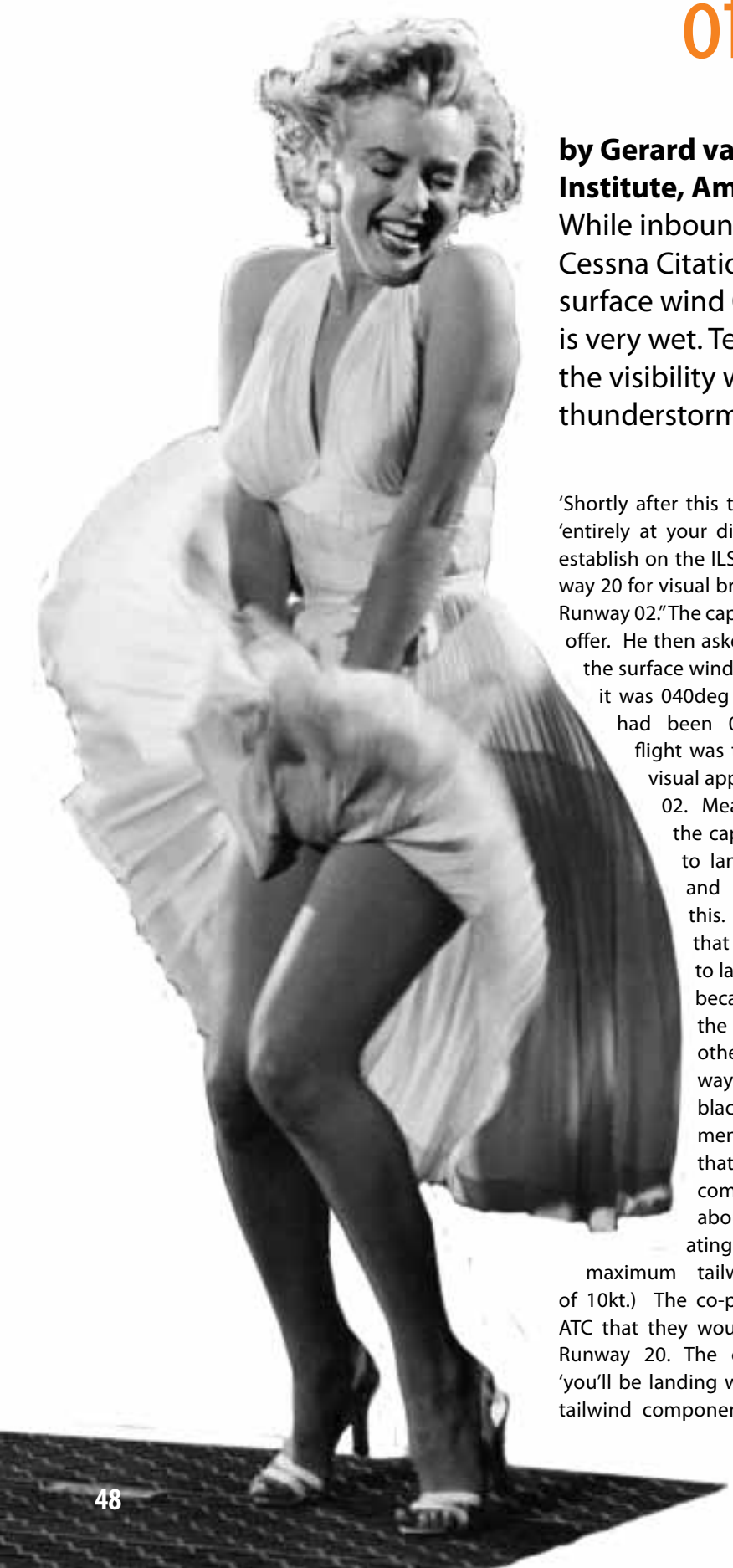
Some hidden dangers of tailwind



by Gerard van Es, NLR-Air Transport Safety Institute, Amsterdam, The Netherlands.

While inbound to Southampton (UK), the crew of a Cessna Citation had been given the weather as surface wind 040deg/12kt, thunderstorms, the runway is very wet. Ten minutes later they were advised that the visibility was deteriorating - 'now 2,000m in heavy thunderstorms.'

'Shortly after this they were advised 'entirely at your discretion you may establish on the ILS localiser for Runway 20 for visual break-off to land on Runway 02." The captain accepted this offer. He then asked the co-pilot for the surface wind and was told that it was 040deg but that earlier it had been 020deg/14kt. The flight was then cleared for a visual approach for Runway 02. Meanwhile however, the captain had decided to land on Runway 20 and told the co-pilot this. He later reported that he had decided to land on this runway because he could see the weather at the other end of the runway appeared 'very black' and he had mentally estimated that the tailwind component would be about 10kt (the operating Manual gives a maximum tailwind component of 10kt.) The co-pilot then advised ATC that they would be landing on Runway 20. The controller replied 'you'll be landing with a fifteen knot tailwind component on a very wet runway.' This message was immediately acknowledged by the co-pilot with the words 'roger, copied, thank you.' However, the co-pilot made no comment to the captain about the tailwind component and did not raise the question of continuing to land on Runway 20 with him. The aircraft touched down normally and within 5kt of the target speed but, given the tailwind and the wet runway, it was not possible to stop it on the remaining runway length and the aircraft overran the end of the runway. After coming to rest, the aircraft caught fire and was destroyed.

Gérard van Es

works as a senior advisory flight safety and operations for the NLR-Air Transport Safety Institute - Amsterdam, the Netherlands.
He is currently involved in the European working group for the prevention of runway excursions.

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Tailwinds are very welcome to pilots when they are flying from A to B since it helps shorten the flight time. However, closer to the runway they can be anything but welcome. Even a bit of tailwind can be a hazard. Tailwind conditions can have adverse effects on aircraft performance and handling qualities in the critical flight phases of takeoff, approach and landing. Tailwind, for instance, increases the required runway length to land on or takeoff from. To the pilot, it is therefore important to have timely and accurate wind information. Controllers are an important link in this process. However, in the end the pilot remains fully responsible whether to takeoff or land. In the above example, the controller offered a favourable runway regarding tailwind. However, the captain decided to land on another runway. The controller in this case informed the crew that they were landing with a 15 knots tailwind on the other runway (remember most civil aircraft are certified for 10 knots tailwind which can sometimes be increased to 15 knots if the airline asks the manufacturer, both on a dry runway). In this example, the runway was wet which normally reduces the tailwind limit. The controller also informed the crew about the very wet runway. Nevertheless, the crew continued their landing on the unfavourable runway. Should the controller have been clearer in his message when he informed the crew about the high tailwind and wet runway? It is not the controller's job to decide to land or not. That decision remains with the crew. In this case, the controller gave adequate warnings which the crew did not react to.

Pilots often complain about unexpected tailwinds aloft during the approach. Tailwinds are a contributor to unstable approaches or rushed approaches which themselves have contributed to many landing overruns in the past. The controller obtains the wind readings from anemometers which are positioned close to the runway. Given that these anemometers are normally positioned on a 10-m tower, the wind measurements derived from them are not representative of the conditions aloft. There are normally significant differences between surface winds and the winds during approach. It is therefore no surprise when a pilot complains to the controller that the winds aloft were different from those advertised at the surface. It is not currently possible for the controller to have more accurate wind reading that also apply aloft.

EDITORIAL NOTE:

More detail on the accident example used above, including the Official UK AAIB Report of the investigation, may be found at:

http://www.skybrary.aero/index.php/C550,_Southampton_UK,_1993_(RE_HF_WX_FIRE)