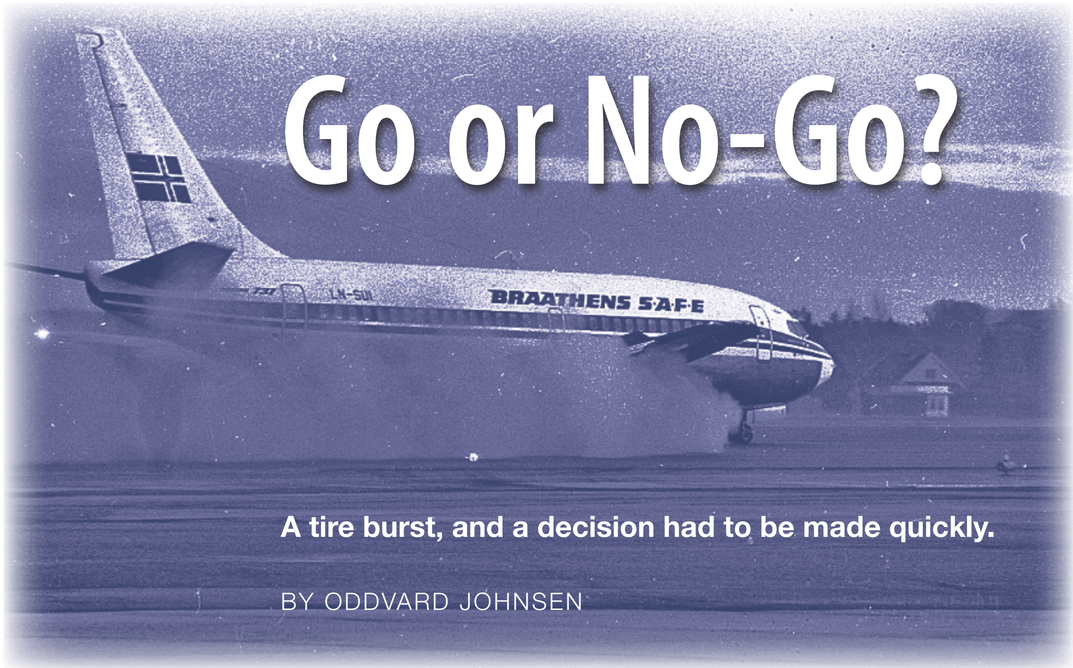

Go or No-Go?

A tire burst, and a decision had to be made quickly.

BY ODDVARD JOHNSEN

A mechanic had performed a routine preflight check, and, as captain of the Boeing 737-200 Advanced, I had conducted a walk-around inspection before departure. No abnormalities were observed. As we began the takeoff roll, the first officer and I sensed that acceleration was not as brisk as normal; then, at about 130 kt, we noticed that the aircraft seemed to be "shivering" sideways. A quick look at the attitude director indicator showed that the aircraft was tilting slightly to the left. Something apparently was wrong with the left main landing gear. A tire failure!

Although well below our 149-kt V_1 — still called the "takeoff *decision* speed" when this incident took place in December 1982 — I decided to continue the takeoff rather than perform a rejected takeoff (RTO) because I realized that, with the apparent inadequate acceleration, the V_1 point geographically had been placed farther down the runway, meaning less stopping distance. Among other factors considered in the split-second decision were the runway conditions. There was a low overcast at the Bergen, Norway, airport. Temperature was 2 degrees C (36 degrees F). A thin layer of slush had been cleaned off the 2,675-m (8,777-ft) runway five hours earlier, and it was officially reported as damp. Nevertheless, pilots had complained for many years that the runway was extraordinarily slippery when wet, but no action had been taken to improve the pavement.

The aircraft was pulled up into the air, entering clouds at 100 ft. We purposely left the landing gear extended briefly to cool the landing gear and prevent a wheel-well fire. Inspection of the runway confirmed that we had left behind a lot of rubber fragments. We broke through the clouds at about 12,000 ft and prepared for an emergency landing at the Stavanger airport, 165 km (89 nm) down the coast, where weather conditions were good. We flew for 2 1/2 hours to burn off fuel and reduce our landing weight. The burn-off was managed to use more fuel from the left wing tanks than the right wing tanks, to reduce the weight on the single tire remaining on the left gear during the landing.

During the flight, an air force fighter pilot offered to join up and visually inspect the landing gear. He confirmed what we had suspected: The left outboard tire had burst and was torn to pieces. There was no related damage, no hydraulic leaks or fuel leaks.

FirstPerson is a forum for sharing personal experiences that have yielded lessons about aviation safety. We welcome your contributions. Send them to J.A. Donoghue, director of publications, Flight Safety Foundation, 601 Madison St., Suite 300, Alexandria VA 22314-1756 USA or donoghue@flightsafety.org.

The passengers accepted the explanation of the situation that I offered over the public address system and behaved calmly.

The emergency landing at Stavanger was conducted with the fuel imbalance within allowable limits. We touched down gently on the intact right main gear and carefully lowered the damaged-wheel side. Maximum allowable reverse thrust was applied (see photo p. 28), but braking was performed only on the intact wheel pair. The remaining left tire served its duty well, until we stopped after turning off the runway; the temperature fuse in the tire popped, causing the tire to collapse.

In retrospect, the tire failure at Bergen, a seemingly minor occurrence, could have had a disastrous outcome if an RTO had been performed. The damaged tire and wheel would have reduced the effectiveness of the antiskid braking system. Moreover, an RTO would have meant full brake pressure, which would have put enormous force on the damaged gear's torque link, possibly causing the intact wheel to twist 90 degrees. The tire would have been torn off,

with just stubs left of the landing gear. A similar outcome had befallen a Fokker F28 during a landing some years earlier.

Post-incident calculations indicated that, even without further damage to the landing gear as described above, the aircraft would have run off the Bergen runway at about 110 kt if an RTO had been performed "by the book." There is only a 130-m (427-ft) stopway at the end of the runway before a rocky slope that drops into the fjord. The accident likely would have resulted in a large number of casualties. There were 129 people aboard the aircraft.

Today, the definition of V_1 has been refined to emphasize that any go/no-go decision must be made *before* reaching that speed. Moreover, RTOs above 100 kt now are considered high risk. But, in the early 1980s, the standard operating procedure was "no go" all the way up to V_1.

At the time of the incident, I had accumulated about 15,000 flight hours, including about 10,000 hours in the 737. I am convinced that many lives were saved by the split-second decision to go — a decision supported by knowing the aircraft quite well and by above-average familiarity with runway pavement issues gained from participating in studies performed by the International Federation of Air Line Pilots' Associations (IFALPA; *ASW*, 8/07, p. 36).

The lesson from this incident is as important today as it was 25 years ago: *Stay ahead of your aircraft.* In my opinion, the ability to stay ahead of the aircraft involves not only experience and knowledge, but also skill in observing and analyzing details gained from continual education. I believe that staying ahead of the aircraft is the deciding factor in why, given the same hazardous circumstances, the outcome is sometimes good and sometimes disastrous. ●

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Oddvard Johnsen is a retired Braathens captain with more than 21,000 flight hours. He has served for the past 35 years as an adviser to the Norwegian Accident Investigation Board on runway conditions and installations, and is former vice chairman of the IFALPA Airworthiness Study Group.