



Technical Article

Violent Failure: Hidden Causes for Destruction of a Grain Silo

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The sudden destruction of a silo at a grain depot in South Africa posed a number of questions. In-depth examination of the silo remains and detailed analysis showed that the silo failure was not caused by structural weakness, but by a 'hidden' dust explosion.

Early on the morning of August 12, 2009, a truck was standing in the loading shed of a small grain depot in rural South Africa (Fig. 2), with the driver sitting in the cab and a worker shoveling grain in the body of the truck. Without warning, the silo closest to the camera in Fig. 2 (silo no. 1) failed violently, flattening the loading shed, killing the unfortunate worker and strewing the grain contained by the almost full silo over a radius of 50 metre.

Fortunately, although the cab of the truck was partially flattened, the driver survived with only minor injuries. Fig. 1 shows the scene after the failure had occurred, with the skeleton of the silo roof in the centre of the field of view, on top of the remains of the silo, and the spread-out remains of the upper parts of the walls that had been projected away from the silo to the left and right.