



## The importance of the Four-Eye Principle and site supervision

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### Summary

The issue of site monitoring of infrastructures come forward on the agenda of owners, planning engineers and users as a result of several unfortunate events - also in Germany.

Case studies are presented related to the hurricanes Lothar and Wiebke, damage events from the harsh winter of 2001/2002 with lots of snow, and caused by the buildup of ice and the formation of water pockets. The examples of rising structures show, why the causes of damage were the combination of a partially inexistent "Four-Eye Principle", lacking site supervision, and poor execution of the works. The examples also illustrate that not only steel and timber roof structures, but reinforced-concrete and prestressed concrete structures, too, are not preserved from damage.

Finally, the potential danger existing in our buildings and the need for building checks throughout the entire life time of a building will be treated.

**Keywords:** Four-Eye Principle, site supervision, monitoring, wind loads, snow loads, damage, drainage, safety-relevant classification of structures, inspection for intervals, operating instructions

## 1 Introduction

Since the middle of the last century, in the course of the transfer of site-supervision tasks, checking engineers in Germany have been commissioned on the part of the state authorities with the validation of the structural safety and fire protection (so called "Four-Eye Principle") including site supervision – not only for new structures. In the course of deregulation / liberalization, however, inspection duties were steadily reduced, which led to a direct increase in damages.

In the past few years, the author was often tasked to furnish an expert opinion on the causes of the (near) collapse of roof structures. The author will explain in summary why the causes of damage from the following case studies were not the wind loads or snow pile-up, but rather the combination of a partially inexistent "Four-Eye Principle", lacking site supervision, and poor execution of the works. In other cases, which are presented, inspections during the utilization of the building would have helped preventing such damage. In the third bloc of case studies the structure did not collapse thanks to the existing checks; yet the roof structure had to be completely removed.

With reference to recent events, the potential danger existing in our buildings and the need for building checks throughout the entire life time of a building could be treated. It is shown under