

# Adequate resilience goes beyond risk management.

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## Abstract:

Urban and industrial safety have in common that unexpected and even unknown threats can strike. Be it violent weather phenomena, flooding and earthquake, security breaches of various kind, or industrial hazards assumed to be contained, but somehow unexpectedly releasing their lethal effects. Of course, it is traditionally considered a must to have emergency response forces available: fire brigade, medical aid and police. Resilience capability, however, goes far beyond such short-term recovery. In our modern society and governmental and company organizations there are many dependencies and interactions which can be disturbed by a wide gamma of threats. This in turn can lead to severe consequences disrupting the functioning of organizations and hence the economy or societal order, while at company scale it can lead to business interruption.

To reduce the chance that disruption will become severe and difficult to overcome, measures can be taken. In fact, one can distinguish four categories of measures:

- First is *error tolerant design* of equipment, networks, processes and even organizations. System simulation can assist in optimizing to obtain minimal vulnerability. Besides hardening, also sufficient flexibility and reserves/redundancy will help.
- Second is *early warning capability*. This is not only to be alert and open for signals from both outside and inside but also to understand what these can mean. The latter is needed in particular at the highest levels of the organization, because only there counter-action can swiftly and effectively be initiated.
- Third is "*plasticity*" in operational thinking, which means "resistive flexibility" or improvisation to reduce effects. Resistive, because by far not every change is going to be successful. Not for nothing management of change is required to perform as impact of a change on the operational risks must be investigated before the change is actually made. Preparatory work in this respect is a necessity.
- Fourth is *recovery capability*. On the short term this means containing disastrous effects as much as possible by well-informed command, effective communication and resilient forces. However, on the longer term it may mean obtaining required funding, skilled workers, and material supply to restore assets and capabilities in case of damage. Business continuity may also mean that temporarily customers are served by alternative sources on an agreed mutual basis.

All this requires detailed risk assessment to be aware as much as possible of threats of various kinds, as well as a resilient organization that is not perplexed by suddenly approaching possible calamity. The keynote will cover various aspects and will present some examples.