

New Risks in Risk Management

by

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How risky is risk management in major economic organizations? Recent worldwide instability in financial markets tied to sub-prime mortgage investments and other credit instruments has called into question risk management practices throughout the financial services industry. Major investors in Goldman Sachs, for example, accuse the company of a “staggering breakdown of risk controls.”

In fact, the limits of risk assessment itself, as a professional discipline, now loom large in a variety of critical infrastructures – not just financial services but telecommunications, medicine and electricity as well. Recent research we have conducted into the electricity sector, for example, reveals just how precarious operations can be in the nation’s electrical grids in ways unaddressed by current risk management techniques widely practiced in the industry.

Electrical grids are in the midst of enormous economic and technological change. As one long-time grid manager observed: “there’s been more change in the industry in the last ten years than in the previous 30 years of my career.” Many of these changes are driven by a quest to optimize efficiency – to provide power at the least cost, either to energy suppliers or consumers. Electrical grid and market restructuring in California offers a prominent example. The economists, engineers, software designers and policy-makers at the heart of these changes, believe as designers that they understand electricity as any other infrastructure, through the formal principles of their disciplines. They believe that the changes they introduce will work as they design them to optimize these systems.

What designers frequently do not understand is that their very efforts at improvement can seriously challenge the skills of control operators to manage essential systems reliably and safely. Two reasons account for this: important factors in the operation of these technologies cannot be covered in the formal models of analysts, and changes frequently fail to work as intended. It is then left to operators to fill in the gaps and cope with the glitches. On the basis of their experience they craft strategies (often called “workarounds”) to manage the design errors that inevitably accompany new policies, software or hardware.

If not managed carefully new infrastructure designs can push operators and supervisors into what reliability researchers refer to as a “precursor zone” – unknown conditions that challenge operator skills and lay the groundwork for more fundamental error or failure. In this zone operators encounter situations not informed by their prior experience. Sometimes new software or hardware itself can limit their control options and thus their ability to cope with the unforeseen. We have certainly witnessed this with the introduction of a variety of new technological and market changes in the California grid. In a similar way, if more spectacularly, innovations in securitized financial instruments have recently pushed entire segments of financial services into their precursor zone. Banks and lending institutions lost the ability to analyze fully the nature of their risks and, ultimately, the market value of their assets.

The important thing about the precursor zone is that precisely because of the novel conditions, and their unpredictable effects on operators in specific circumstances, the risks of failure cannot be calculated. Risk assessment models will not capture these uncertainties.

It is one thing for business strategy to spread risk; it is quite another for strategy to render risks unknown or unknowable. Operators and their supervisors are pushed to reliability “edges” not fully understood by

upper management. Thus financial bubbles become a threat because the longer they persist the more uncertainty and ignorance descends over just what the hazards are and how risky they may be. In this sense a market bubble is really a failure among many institutions to effectively manage risks.

The risk of risk management arises not simply in financial services and electricity, but in other infrastructures where individual managers and operators are important guarantors of reliability. If we truly hope to manage risks, we need to recalibrate our understanding of them in relation to the skills and often hard won experience of managers and operators. In the meantime, it is ironic that our efforts to make economic transactions in a variety of sectors “smart” are increasing our ignorance about one of the most important issues of all – the risks of managing risk the way we currently do.

(Emery Roe and Paul Schulman have done extensive research into reliability challenges in critical infrastructures. Their findings are reported in their new book, *High Reliability Management: Operating On the Edge* just published by Stanford University Press.)