Guest Editor's Introduction : Designing Safety

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Abstract
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Reference

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Guest Editor’s Introduction: Designing Safety

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It is with great pleasure that I accepted the invitation to introduce a number of entirely original articles which deal with the question of the contribution of organizational design to safety. This question runs throughout this issue of Management Focus.

Some Background

The study of high-risk organizations has expanded considerably over the past 20 years following the incidence of exceptional catastrophes (Bhopal, Chernobyl, Three Mile Island, Challenger, Columbia...). The resulting literature is rich and reflects the varied approaches taken to this study. First, the psychological approach has attempted to understand human errors. Second, ergonomics tried to assess the contribution of human activity to reliability. However, other fields have also contributed: sociology, organizational theory and political science fields when the question of understanding structures arose.

Current research is trying to find answers to the following questions: are these high-risk organizations like others or are they unique due to the sensitive conditions under which they operate? How have these organizations tackled the problem of ensuring total safety on a daily basis? What are the conditions under which this safety performance is obtained most of the time? What are the greatest threats to this permanent quest for excellence? How can the variance between different organizations be measured?

There seem to be two main controversies in the literature on this subject. Firstly, the opposition between the supporters of the H.R.O. theory (High Reliability Organizations) – represented here by the psychosociologist Karlene Roberts – and the “Normal Accident” theory proposed by Charles Perrow. The HRO theorists believe that certain high-risk organizations which they refer to as HRO, have managed to develop original and unusual “risk mitigation” skills. The key to such strategies appears to be based on the co-existence of hierarchical structures which are obeyed to the letter when things are going well, and far more informal networks – but which are nonetheless recognized and rehearsed – which are activated when circumstances require. According to HRO researchers the strength of these organizations resides in their adaptability and their redundancy.

On the other hand, Perrow proposes the theory that these organizations are condemned to failure because the technology and organization of the activities are designed separately. The real problem is the inability of the organizations to deal with their inherent complexity. In particular, the technological and organizational redundancy, which are at the root of their complexity, are also the source of accidents.

However, these two points of view are not irreconcilable in that they focus on the structure of these organizations, namely on the organizational design and the contribution of this design to safety.

A second controversy surrounds the influence of the role of rules in achieving optimum safety performance. As highlighted in my own article, there are two opposing views. The first held mostly in industrial and regulatory circles, has long emphasized that safety can only be guaranteed by strict compliance to predefined rules. Any observed variances together with any violations should be resisted as they are thought to be a risk threat.

Alternatively, many ergonomical, psychological and sociological studies have shown that the situation is more complicated. Large variances exist because rules cannot provide for every situation. In fact the
same rules are thought to be unsatisfactory in an emergency situation and transgressions have often been found to be necessary to obtain safe performance. The transgressions remain informal and result from expertise which often has no formal recognition.

However, when taken to the limit, the literature finally admits that safety is ensured by daily micro-violations of the rules. The authors of this collection of articles all disagree with such a conclusion. Design matters, they argue, though our understanding of what organizational design is or should be, and how it impacts on reliability, has to be revised and updated in the light of what we have learned about the microprocesses of daily action in organizations. With various empirical and theoretical groundings, they advocate for a more subtle approach to the relationships between design and reliability.

**Formality Makes a Comeback**

Taken as a whole, these four articles agree on the importance of organizational design in any high-risk activity. The way in which decisions are made upstream should not be reduced to a rigid framework as it can have an enormous influence on the type of social rules which will be set up later. This is not an argument to reinstate the primacy of any sort of determinism for structures and rules, whilst denying local appropriation of these by the actors involved. The objective is simply to draw attention to the fact that the social activity of formatting and planning based on rules, plans or planning, influences such future options available to deal with any unexpected situation occurring within an activity.

Thus systematic and opaque violations of regulations and social structures are not the norm. The question of the production of regulations and formal structures is central. When these regulations are produced in such a way as to be self-corrective and deliberative then the need for violations loses importance. These arguments are presented in the interview with Kar-lene Roberts when she discusses the specificity of H.R.O organizations.

Gautherau and Hollnagel approach the problem from a different angle and encourage us to revisit the classic dilemma between centralization and decentralization which is at the heart of the difficulty in managing high risk organizations. Using the example of a planned maintenance outage (interruption, or period of non-operation), in a Swedish nuclear power plant, they show how planning is never at any time undertaken to provide a rigid framework but rather as a resource for action. Planning schedules are constantly readjusted by a set of “constrained improvisations” which cannot be assimilated to a simple adjustment of circumstances.

Finally, in the light of the recent accident of the Columbia space shuttle, Heimann returns to the relationship between one type of risk (type I risk – loss of installations and/or life – type II risk – waste of resources) with the type of structure of activities (redundancy in series or in parallel). The strength of this analysis is that it identifies a link between organizational design and the type of risk which the organization is seeking to prevent. This article offers managers food for reflection by introducing them to the unrelenting dilemma which these organizations constantly face.

The sample of current research presented here is dynamic. It offers the possibility to change a whole set of received ideas on the operation of high-risk organizations, which are present at the heart of our society. Management of these organizations is difficult and perilous. Management could benefit from the results of the research being conducted in this field, which unfortunately rarely finds its way into real-life decision-making circles.

**Acknowledgement**

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