

Resilience to Unexpected Impacts of Emerging Risks in IRGC's Recommendations for Emerging Risk Governanceⁱ

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As seen in (Florin, Resilience in IRGC's Recommendations for Risk Governance), adopting resilience building as a risk management strategy aims to help systems cope with unexpected changes. The objective here is primarily to prepare, plan, absorb, recover and adapt. IRGC proposes that resilience strategies should be considered for risks marked by uncertainty and unexpectedness, as often the case in complex adaptive systems, but that other conventional risk management strategies should not be neglected.

Emerging risks

IRGC's recommendations for dealing with emerging risks is described in four publications, listed in the bibliography.

Emerging risks are risks that are new or emerging in new context conditions. Risk managers are not familiar with them. They are marked by uncertainty, which makes that conventional risk management approaches are often inappropriate.

IRGC describes three categories of emerging risks, resulting from:

- Scientific unknowns:
when uncertainty and a lack of knowledge about potential impacts and interactions with risk absorbing systems may cause risk to emerge.
- Complexity and dependencies:
when increasing complexity, emerging interactions and systemic dependencies have the potential to lead to non-linear impacts and surprises
- Uncertain changes in context:
When changes in context (in societal or behavioural trends, regulation, or the natural environment) may alter the nature, probability and magnitude of expected impacts.

ⁱ This paper is part of the IRGC Resource Guide on Resilience, available at: <https://www.irgc.org/risk-governance/resilience/>. Please cite like a book chapter including the following information: IRGC (2016). Resource Guide on Resilience. Lausanne: EPFL International Risk Governance Center. v29-07-2016

Management strategies and options for emerging risks

The rationale for thinking about risk management strategies, as described in (IRGC 1) applies to emerging risks and is illustrated in Figure 1 below.



Figure 1: Risk management strategies for emerging risks

Risk management strategies for risks marked by complexity and uncertainty are to be considered for emerging risks. They include resilience-building strategies. A combination of these strategies produces a refined set of two main strategies:

- To act at the level of the source of the risk: Analyse and try to act to the contributing factors to risk emergence, in order to avoid, reduce or mitigate the cause of the risk
- To act at the level of the impact of the risk: Develop adaptive management and design and implement resilience building strategies, in order to cope with the impact of unexpected surprises that will happen if the risk materialises.

Management options for emerging risk thus include, in a non-exclusive manner:

- Option 1: Acting on the contributing factor to the risk, to stop or reduce the development of the emerging risk
- Option 2: Developing precautionary approaches, to avoid the risk or to allow the decisions taken about it to be reversible
- Option 3: **Reducing vulnerability**
If the organisation cannot (or finds it difficult to) identify any opportunity to act upon the sequence of events leading to a risk, or if the intervention is considered inappropriate or too costly, a reduction in the exposure or an effort to decrease vulnerability to the risk agent can be a strategic option.

Two possibilities can be considered:

- In the case of emerging but well-identified risks, it is possible to reduce sensitivity to the risk by developing redundancies, improving personnel training or readjusting protection capabilities.
- In the case of unexpected events, building *resilience* may be the most appropriate strategy. This implies considering worst-case scenarios to ensure that organisations will be able to withstand unexpected shocks, rebound to the desired equilibrium while adapting to the changed context and, in general, recover from any levels of stress while preserving operational continuity. **Resilience building thus becomes a dynamic pro-active strategy for adaptive risk management. It implies that a learning process is set in motion to adapt to changing context conditions.**
- Option 4: Modifying the risk appetite in line with the risk
Dealing with emerging risks requires that organisations constantly align their risk appetite to changes in their environment, the availability of new knowledge, and their resources and capabilities to tolerate or cope with potential risk losses. Such alignment may be made by increasing the tolerance for risk, by adapting the coping strategies to the new levels of risk that are observed or anticipated.
- Option 5: Using risk management instruments for familiar risks
- Option 6: Monitoring the emerging risk evolution until more knowledge is collected about the source and the impact of the risk.

Evaluating the strategic options

The evaluation of strategic options depends primarily on:

1. *The state of development of the emerging risk and the level of knowledge about it.*

When little is known about the threat but it potentially has severe negative consequences, precaution-based and resilience-focused strategies can ensure the reversibility of critical decisions and increase the system's coping capacity so it can withstand shocks or adapt to new contextual conditions. A case in point are new materials or technologies (such as nanomaterials or new precision medicine therapies) with potentially unknown effects. But when a well-known risk develops in new contexts, considering risk management instruments used for familiar risks is advisable. Or when an evaluation is made that the promises of the new technique exceed the risk, then increasing the risk appetite is advisable.

2. *The set of evaluation criteria that the decision-makers will choose to adopt*

- Effectiveness: To what extent does the selected option achieve satisfactory performance in accordance with the decision-makers' expectations? Resilience may increase the capacity of a system to recover from an unexpected shock, but it may reduce its performance under normal context conditions. Building community self-support is normally time intensive and requires a large investment in engaging with individuals.
- Efficiency: Does the selected option provide satisfactory performance at a minimum cost? Resilience building is typically more expensive than conventional mitigation options. For example, building "floating" house with water entrance strategies is more expensive than avoiding water entry with conventional flood barriers.
- Sustainability: How does the option perform in economic, ecological and social terms?

- Socio-political acceptability: How does the option address issues of equity or distribution of costs and benefits among stakeholders?
- Ethical standards: Is corporate responsibility enhanced? To what extent is the distribution of benefits and risks considered fair?

Success factors for resilience building

Resilience building as a strategy to cope with emerging risks requires engaging in work to understand better the system's behaviour or function, especially when the system itself is changing. Success factors include to:

- Look to the long term
 - Engage in early-warning activities: look out for, analyse and make sense of signals and develop exploratory scenarios, so that affected organisations and people are not "taken by surprise". Engaging in scenario building exercises can support the development of resilience capabilities and perhaps, more importantly, provide the rationale that justifies spending money on resilience building.
 - Build "antifragility", that is the sense that you cannot prepare for everything (e.g. scenarios that are too deterministic, relying on cause-effect relationships are not appropriate for
- Engage in robust decision-making, which is the ability of decisions to display good enough (though not optimal) performances for various possible futures. Planning in a situation of uncertainty requires adaptability to new situations, iterative risk and resilience assessment and management, consistency and procedural rationality, established, transparent and applied procedures.
- Develop management and human capacity – develop flexible and adaptive management, of the type that can accompany the transformation of systems.
- Develop metrics to measure system-specific quality, metrics to assess resilience, which can be used to justify and allocate resources - consider "benefit-cost approach to decision-making, based on available resources & capabilities, and expected return on investment

Annotated Bibliography

Florin, M.-V. (2016). *Resilience in IRGC's Recommendations for Risk Governance*, in IRGC's recommendations for risk governance, in IRGC Resource Guide on Resilience, <https://www.irgc.org/risk-governance/resilience/>.

IRGC (2005). Risk governance, towards an integrative approach, International Risk Governance Council, Geneva. Available from <https://www.irgc.org/risk-governance/irgc-risk-governance-framework/>

This report introduces the IRGC risk governance framework, a comprehensive approach to risk framing, scientific and concern assessment, risk evaluation, risk management and risk communication.

IRGC (2010). Contributing factors to risk emergence, International Risk Governance Council, Geneva. Available from <https://www.irgc.org/risk-governance/emerging-risk/irgc-concept-of-contributing-factors-to-risk-emergence/>

This report introduces the concept that managers must work to analyse and understand what influence on the development of an emerging risk. Some contributing factors are controllable, and risk managers should focus their action on avoiding or reducing their cause and reducing their impact on the development of the risk. Some other factors are outside of their ability to control and, in that case, managers can develop strategies to adapt to the risk.

IRGC (2011). Improving the management of emerging risks, International Risk Governance Council, Geneva. Available from <https://www.irgc.org/risk-governance/emerging-risk/risk-management-in-industry/>

This report focuses on emerging risks from new technologies, system interactions and unforeseen or changing circumstances. It reviews management strategies, primarily in industry and technology.

IRGC (2015). IRGC guidelines for emerging risk governance, International Risk Governance Council, Lausanne. Available from <https://www.irgc.org/risk-governance/emerging-risk/a-protocol-for-dealing-with-emerging-risks/>

This report proposes a set of comprehensive guidelines for the governance of emerging risks. It draws from several disciplines, including risk management, innovation management, foresight and scenario development, robust decision-making and strategy implementation.