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NEW TECHNOLOGIES - RISKS AND OPPORTUNITIES

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Overview of the challenges and opportunities arising from new and developing technologies in risk management and workers' compensation insurance

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NEW TECHNOLOGIES AS DRIVERS OF CHANGE IN THE RISK LANDSCAPE

Fast-paced technological development is a key driver of change in the risk landscape, not only with regard to workers' compensation insurance but in the entire non-life insurance sector. An era of intensive technological advancement is affecting all industries. It is having a significant influence on our working environments and, very likely, on our working lives. The perpetual and ever-increasing need to improve productivity has led to technological innovations that aim at rapidly improving the efficiency of work and manufacturing. Emerging technological innovations are spreading quickly, often resulting in heavy dependence on such innovations.

This fast technological evolution, on one hand, is associated with completely new risks and, on the other, may change the nature of conventional risks. Meanwhile, there is a danger of increasing vulnerability of work and production systems, amplified by more complex systems and their mutual, complicated dependencies. Such changes will be associated with major challenges to risk assessment and management, which particularly affect the nature of potential occupational safety risks and accidents.

An earlier study by the Finnish Institute of Occupational Health, published in 2009, indicated that while nano-, bio-, information and communication technologies will become the key technologies of the future, their possible health risks will continue to cause controversy. Based on the assessments carried out by 29 experts on working environments and technology, the study considered future technological development and the associated health risks. The new technologies most detrimental to health were thought to be nano- and biotechnologies. According to these experts' opinions, technological development will particularly impact the following sectors:

- Electronics industry
- Metal industry
- Food industry
- Paper industry
- Energy industry
- Textiles industry
- Technologies using nonionising radiation
- Industrial recycling
- Chemical industry
- Healthcare technology
- Cosmetics industry
- Data communications industry

After the study, even during it, major global efforts have been made to invest in green technology, or "greentech", which encompasses a wide range of technologies and innovations that aim to promote opportunities for sustainable development. For example, they may reduce dependence on fossil fuels and improve the recycling of raw materials. The sector is booming, but until recently little

research has been conducted on the risk factors associated with it. Robotics can no longer be considered a new phenomenon or technology, this field also continues to develop. Public debate has only recently begun on the risk perspectives associated with one of its latest innovations, 3D printing technology.

In an environment characterised by intensive competition and innovation there is a risk of not allocating adequate resources to testing new products and ensuring that they are safe. In technological innovation, insufficient consideration given to safety aspects will inevitably lead to an increasingly complex risk environment that is difficult to control. This outcome is exacerbated by the widespread inability of legislation and standardisation efforts to keep pace with rapid technological innovation. As such, they are always assumed to remain one step behind the latest developments.

Nanotechnology development, which is taking place at a great speed, is usually thought as one of the drivers of the current technological revolution. Smaller, lighter and more efficient materials, components and systems have the ability to transform industrial manufacturing processes. Engineered nanomaterials will have significant applications in environmental technology, and elsewhere. However, in risk assessment and management the ensuing high levels of uncertainty about the health effects of new nanoapplications, combined with the international disagreements about regulation in this sector, are causing problems. The key solution here is to increase knowledge, especially of toxicology. In Finland, several studies in this field have been launched, and the Workers' Compensation Center is one of the bodies studying the risks related to nanotechnology. A report on the subject will be published in full in late 2016 as part of the Workers' Compensation Center publication series.

Rapid advancements in communication technology are quickly transforming the ways we perform work. The share of remote working has increased and this trend is likely to continue as, in more fields than ever before, work is no longer tied to a specific location. While this is no longer a new phenomenon, the methods of work keep evolving. It is important to remember that, in discussing the risks and opportunities posed by new technology, the debate should not be limited to the working environments of traditional technology industries.

RELIABLE RISK IMPACT ASSESSMENT REQUIRES MORE IN-DEPTH UNDERSTANDING OF RISK FACTOR CAUSALITIES

Accelerating technological development challenges the assessment of occupational health and safety risks in a major way, also from the point of view of those being insured. Assessors should be able to consider the risk factors and the effects of exposure but, at the moment, this information is often found lacking as the issues were perhaps first raised only a few years ago. Technological innovations invariably make their way to our working lives. For example, products involving nanotechnology are already exploited widely in several working environments and processes, from product innovation to the recycling of end products. No sectors or occupational groups can be ignored when exposure to these technologies is assessed.

New technologies can have very complex impacts on occupational health and safety: the systems themselves are complicated and involve an intricate causality network where the factors interact through several effect mechanisms. In occupational safety, such factors are related to both the work itself and the management of occupational safety. The level of risk management directly affects the risk profiles of the persons being insured. With increasingly complex systems, risk assessment and management methods must be developed to comply with the new environments.

Comprehensive knowledge of the risks and opportunities that come with emerging technologies is vital, also with regard to the implementation of workers' compensation insurance and the management of risks affecting the insurance business. For insurance business to be successful, assessment of the insured risk must be as accurate as possible.

PLANNING FOR NEW TECHNOLOGY AND PREVENTING DAMAGES ARISING FROM IT

In new technology projects, more attention should be paid to risk assessment, right from the planning stage. However, sufficient understanding of the potential health impacts of new technologies not yet exists, which poses special challenges to anticipation and continued risk monitoring.

Successful risk management requires a safety-oriented approach and good national and international cooperation between the parties. This only becomes possible in operating environments where all

parties are fully committed to promoting safety. Relevant dialogue and the ensuing synergies ensure that operators will understand the basics of the emerging innovations in order to implement credible risk assessments. With regard to safety measures, the focus must be on improving both system resilience (~ agility) and technical solutions for managing the risks associated with technology. In practice, improved system resilience means the development of methods and safety culture that enable maximum responsiveness for the purpose of managing the rapidly evolving risk climate.

In planning and reviewing risk management measures, attention should be paid to minimising the consequences of realised risks. Management measures are planned so as to prevent undesired events. However, reliable solutions should also be designed for situations where, despite all the other preventive measures, the identified risk is realised. As a rule, the planning process should include exceptional events that occur outside the process or the operating environment.

With regard to risk management, it is important to develop international harmonised standards and relevant legislation, at least those concerning safety-critical technical regulations and solutions, including effective and agile processes to keep them up to date. In addition to relevant understanding and declarations, the implementation and active maintenance of essential risk management measures must be ensured. Safety-oriented product developers and markets, however, will not be enough. Effective supervision is also required, and to carry out such supervision the authorities need adequate resources.

There are many ways in which insurers can participate in the management of technological risk. Risk management relies on close client contacts that can also be useful in communicating the risks and consulting about them. The fact that risk assessment is unreliable as far as new technologies are concerned should also affect the designing of payment systems. Tariff development is important for risk reciprocity and management of risk in the insurance business. It could also provide a financial incentive in steering product development, production and jobs towards a more active and reliable management of safety risks.

EMERGING TECHNOLOGIES OFFER MANY OPPORTUNITIES TO INSURERS

New and developing technologies cannot merely be considered a challenge to risk management, even in the insurance sector. Technological innovation makes a difference to the insurance business and can open up new ways in which workers' compensation insurance is implemented. For example, development of medical technology is creating major new opportunities, such as new screening methods. As diagnosis of injuries and illnesses become more accurate, confidence in the system increases. Up to now, outcomes of information and communication technology developments and innovations have not been exploited to the best possible extent. Digitisation of services will create significant opportunities, such as improved services in the fields of workers' compensation insurance and occupational safety. The sector is only taking its first steps towards better exploitation of big data and predictive analytics.

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The opinions expressed in this analysis report are those of the author.

The analysis was concluded in July 2016.

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