

Risk Management in Practice

Lecture Title:
Risk Management for Emerging Workplace Hazards

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**Undergraduate Diploma in
Occupational Health and Safety**

Welcome and Objectives

This lecture focuses on identifying and managing emerging hazards in modern workplaces. It covers technological advancements, new materials, and evolving work practices that introduce novel risks. Participants will learn proactive strategies for anticipating and mitigating these hazards before they escalate.

Learning Objectives

1. Identify emerging workplace hazards
2. Understand the risk implications of technological and organizational changes.
3. Apply risk assessment methodologies to new and uncertain hazards.
4. Develop proactive strategies for integrating emerging risks into existing risk management systems.



Why is it significant within the context of Risk Management in Practice?

1. Risk management in practice deals with evolving, real-world conditions, not only established or regulated hazards
2. Emerging workplace hazards often lack data, standards, and specific legislation, requiring informed professional judgement
3. Technological and organisational change alters risk profiles, testing the practical application of risk assessment tools
4. Practitioners must adapt existing risk management processes to manage uncertainty and innovation

What do we mean by “emerging workplace hazards”?

Emerging workplace hazards are new, evolving, or increasingly recognised risks to workers' health and safety that arise from changes in technology, work organisation, workforce demographics, or the wider environment.

These hazards may not yet be fully addressed by existing legislation, standards, or traditional risk control measures.



Key Characteristics of Emerging Hazards

1. Result from changes in **how work is designed or performed**
2. **Limited historical data** or incident records available
3. **Health effects may be uncertain**, delayed, or cumulative
4. **Regulatory guidance may be incomplete** or still developing
5. Often **under-recognised** by organisations and workers

Managing Emerging Hazards

1. Broaden **hazard identification** beyond checklists
2. Encourage **worker participation** and reporting
3. Apply the **precautionary principle** where uncertainty exists
4. Regularly **review and update** risk assessments
5. Adapt control measures as **new evidence emerges**



Key Takeaway

1. Emerging workplace hazards reflect the changing nature of work.
2. Effective risk management requires organisations to anticipate, monitor, and manage new risks before harm occurs.



Legal, Ethical, and Organisational Implications

Ignoring emerging hazards can result in:

1. Non-compliance with the general duty of care
2. Reputational damage and loss of trust
3. Increased incidents, illness, and compensation costs
4. Failure to meet ethical responsibilities to protect workers

Recognising emerging risks is therefore both a legal and moral obligation.



Innovation, Change & Uncertainty

Emerging hazards sit at the intersection of:

1. Innovation (new technologies, materials, systems)
2. Organisational change (new ways of working)
3. Risk uncertainty (unknown probabilities and consequences)

Risk management shifts from control of known risks to management of uncertainty



Innovation and Risk Management

Innovation involves the introduction of new technologies, materials, processes, or ways of working.

From a risk management perspective, innovation:

1. Alters how tasks are performed and controlled
2. Introduces unfamiliar hazards and exposure routes
3. Reduces the relevance of historical accident data
4. Creates uncertainty about health and safety outcomes

As a result, innovative workplaces often face emerging and poorly understood risks.



Organisational Change and Risk Exposure

Organisational change includes changes to:

1. Work organisation and job design
2. Management structures and responsibilities
3. Employment arrangements (e.g. outsourcing, gig work, remote work)

Such changes can:

- Disrupt established safety systems
- Create gaps in supervision, training, or communication
- Shift risk responsibility and accountability
- Increase psychosocial and human factors risks

This can lead to new or intensified hazards that were not present previously



Uncertainty in Risk Management

Innovation and organizational change both increase uncertainty in risk management because:

1. Hazards may not yet be fully recognized
2. Likelihood and severity of harm may be unclear
3. Long-term or cumulative health effects may be unknown
4. Existing controls may not be designed for new risks

Uncertainty challenges traditional, assumption-based risk assessments



Relationship Between Innovation, Change, and Uncertainty

Innovation and organisational change are key drivers of **emerging workplace hazards**.

Together, they:

1. Introduce new sources of risk
2. Change exposure patterns and risk interactions
3. Increase reliance on judgement rather than historical data
4. Require organisations to manage risk in conditions of incomplete information

This strengthens the need for adaptive and precautionary risk management.



Known Risks vs Emerging Risks

Known / Regulated Risks	Emerging Risks
Well documented	Limited evidence
Clear legal standards	Ambiguous requirements
Established controls	Controls evolving
Historical data available	Reliance on judgement

Case Study 1 – Algorithmic Work Allocation

Context:

A logistics company uses AI to allocate work and monitor performance

Emerging hazards:

- Work intensification
- Stress from opaque decision-making
- Reduced autonomy

Discussion prompt:

- Is this primarily a technical risk or an organizational one?



Overview: Drivers of Emerging Hazards

Emerging risks are driven by:

- Technology
- Materials and processes
- Organizational and societal change

These drivers often occur simultaneously

Technological Drivers

Automation and robotics

1. AI and machine learning systems
2. Digital monitoring and surveillance
3. Algorithmic decision-making

Risk challenge: Speed of deployment exceeds risk understanding



Material & Process Innovations

1. Nanomaterials
2. Advanced composites
3. New chemical formulations
4. Additive manufacturing (3D printing)

Key issue: Exposure pathways and health effects not fully understood



Organisational & Societal Change

Remote and hybrid working

1. Gig economy and subcontracting
2. Ageing workforce
3. Increased work intensity and precarity



Case Study 2 – Nanomaterial Handling

Context:

Maintenance staff clean filters from a system using nano coated materials.

Challenges:

- No internal exposure data
- Limited regulatory guidance
- PPE effectiveness uncertain

Discussion:

Who owns the risk — supplier, employer, or OSH professional?



Why Emerging Hazards Challenge Practice



Limits of Traditional Risk Management

Traditional approaches struggle because they assume:

- Stable systems
- Predictable hazards
- Reliable data

These assumptions fail for emerging risks



Risk Normalisation

- New technologies rarely feel dangerous at first
- Familiarity grows faster than understanding
- Risks become accepted as “normal” before being managed



Key Takeaways

Risk management in practice often operates with incomplete information.

This requires:

- Professional judgement
- Ethical responsibility
- Precautionary thinking



Case Study 3 – Wearable Monitoring Devices

Context:

Employees required to wear biometric safety trackers.

Potential hazards:

- Data misuse
- Stress from constant monitoring
- Privacy concerns

Question:

Can a risk be acceptable if its consequences are unclear?



Applying Risk Assessment Methods



Revisiting Risk Assessment Tools

Traditional tools are still useful, but must be:

- Adapted
- Used cautiously
- Supported by qualitative judgement



What Still Works Well

1. Structured hazard identification
2. Team based assessment
3. Cross disciplinary input
4. Documentation and traceability



What Requires Adaptation

1. Numerical risk ratings
2. “Low risk” assumptions
3. Infrequent review cycles
4. Overconfidence in scoring



Approaches Suited to Emerging Risks

1. Qualitative and semi quantitative methods
2. Dynamic risk assessment
3. Scenario based “what if” analysis
4. Precautionary principle



Dynamic & Living Risk Assessments

1. Risk assessments must evolve
2. Updated as technology, work, or evidence changes
3. Linked to management of change (MoC)



Proactive Risk Management Strategies



From Reactive to Anticipatory Risk Management

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1. Traditional approach:

Incident → Investigation → Control

2. Emerging risk approach:

Change → Anticipation → Prevention

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Horizon Scanning

1. Monitoring technological trends
2. Learning from other sectors
3. Using near misses and weak signals
4. Engaging workers early



Embedding Emerging Risks

Emerging risks should be integrated into:

1. Risk registers
2. Change management processes
3. Design and procurement decisions



Applying the Hierarchy of Control

Even when controls are unclear:

1. Elimination through design choice
2. Substitution of safer alternatives
3. Engineering via isolation or automation
4. Administrative controls as interim measures



Role of Worker Feedback

1. Workers experience unintended consequences first
2. Psychological safety encourages early reporting
3. Learning systems prevent normalisation



Case Study 5 – Remote Work & Ergonomics

Context:

Permanent home working introduced rapidly.

Hazards:

- Poor workstation setup
- Blurred work–life boundaries
- Psychosocial strain

Task:

Design one proactive control where legislation is unclear.



Regulatory Trends & Governance



Regulation vs Innovation

1. Regulation is reactive by nature
2. Innovation moves faster than law
3. Emerging risks test duty of care principles



Regulatory Shifts

Movement towards:

- Goal based regulation
- General duties of care
- Requirement for risk based judgement



Key Takeaways

- Emerging hazards challenge traditional risk methods
- Uncertainty is unavoidable in modern OHS practice
- Proactive, judgement based risk management is essential
- Effective risk management enables safe innovation



Which emerging hazard should OHS professionals prioritise today to prevent tomorrow's incidents?

1. What is one workplace hazard today that didn't exist when you first entered the workforce?
2. Which new technology do you think brings the most safety uncertainty?
3. What is a workplace trend that you think will create future hazards?
4. Do you think companies adopt new technologies faster than they manage the risks?



5. What's the most misunderstood emerging hazard in your industry?
6. Which type of emerging risk do you find hardest to assess — technical, organisational, or psychosocial?
7. Have you ever encountered a workplace hazard that people initially dismissed as harmless?



8. Do you think emerging hazards are mostly created by technology or by how organisations use technology?
9. What is an example of a hazard that becomes visible only after a near miss?
10. Which safety control is most difficult to apply when dealing with an emerging risk?



11. What do you think is the biggest barrier to managing emerging risks effectively?
12. Which profession or industry do you think faces the fastest-changing hazards today?
13. Do you think risk assessment methods are keeping up with innovation? Why or why not?
14. Have you seen a hazard become “normal” simply because people got used to it?



16. Do you think AI in the workplace creates more opportunities or more risks?
17. What is one small change companies could make today to better manage emerging hazards?



Next: Lecture 15: Global Perspectives and Cultural Considerations

Examines how cultural differences and global contexts influence risk perception, communication, and implementation of health and safety practices. Includes case studies from multinational organizations.

Learning Objectives:

1. Analyze how cultural factors affect risk perception and decision-making.
2. Identify challenges in implementing H&S risk management globally.
3. Develop strategies for effective cross-cultural communication in risk management.
4. Apply global standards while respecting local cultural norms

