A Quantitative Fire Risk Assessment to Enhance Railway Tunnel Safety

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Contents

1. Warm up
2. Safety Culture and Management Oversight
3. Safety Management Systems
4. IOSH
5. Concluding Remarks
Types of Response from Audience

- Comply and play the game ➔ Participatory
- Not enthusiastic but follow anyway ➔ Reactive
- Change the instruction and play it differently ➔ Negotiated
- Don’t listen to him, come play my game instead ➔ Oppositional

Same reactions can be seen from staff in response to safety instructions and procedures
Challenges to Multinational Businesses

• Each business unit has its own local management style, safety climate, safety management maturity level, while under one company’s governance
• Different pressure and focus in operations, timeline and resources
• Contractors have lower awareness of safety and different levels of expectation

We have limited resources and we do not have spare staff or time for safety

Don’t bother me with these safety stuff, I need to meet business targets

We need to cut costs, let’s cut safety staff first since we are doing ok in these years

These safety requirements will slow us down, hire a contractor to get it done fast

The absence of accident does not necessarily indicate the presence of safety
Progress of Safety in an Organization

- Safety Skill Improvement Periods
- Safety Management System (SMS) Enhancement Period
- Safety Culture Enhancement Period

Accident Rate vs. Time
Safety culture enhancement is the key to further reduce your accident rate
Safety Culture

“...the product of individual and group values, attitudes, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s Health & Safety programmes...”

“...the way we do things around here...”
Improving Safety Culture

We cannot change the human conditions, but we can change the conditions under which humans work.
Stages of Safety Culture - The Bradley Curve

External Motivation
COMPLIANCE
Rules, Procedures, Protocols

Internal Motivation
COMMITMENT
Leadership, Role Model, Influencing, Engagement

Reactive
- Safety by natural instinct
- Compliance is the goal
- Delegated to safety manager
- Lack of management involvement

Dependent
- Management commitment
- Condition of employment
- Fear/Discipline
- Rules/Procedures
- Supervisor control, emphasis and goals
- Value all people
- Training

Independent
- Personal knowledge, commitment and standards
- Internalization
- Personal Value
- Care for self
- Practice and habits
- Individual recognition

Interdependent
- Help others conform
- Being others’ keeper
- Networking contributor
- Care for others
- Organizational Pride

‘I follow the rules because I have to’  ‘I follow the rules because I want to’
Types of Safety Culture

Forced Culture

- management use forced culture uses bonus and threats to motivate workers
- Code enforcement is the focus of health and safety officers, who are seen as the “safety police” to catch workers doing something wrong and write them up
- This “carrot and stick culture” receives minimal job performance from workers because fear does not cultivate high-level performance
- For start up, workers with low safety awareness, robotic work
Types of Safety Culture

Protective Culture
- Implements safety programs for workers with endless "policies and procedures"
- When a worker violates a policy or procedure, management’s first reaction is to write more policies and procedures, resulting in the creation of an unending flow of regulations that leave everyone confused
- Health and safety officers are document producers, writing rulebooks and manuals
- Produce average job performance within an industry
- For reactive management, highly regulated industries with legal liabilities
Types of Safety Culture

Involved Culture
• High levels of safety training sessions held for workers but not attended by top management
• Workers morale is high because management is more interested in monitoring by performance than monitoring behaviours
• Health and safety officers are trainers, teachers, theoretical
• Organizations that are “doing OK” run the risk of settling for OK, no desire for structured, continual improvement
• For commission/ bonus-based workers with high mobility, units working in silo
Types of Safety Culture

Integral Culture
• High levels of safety training for workers and top management, including the CEO
• Safety department tends to be small; have budgets and authority
• Health and safety officers have strong industry experience, knowledgeable in many disciplines, work closely with senior management setting goal and policy
• Using maturity model to set direction and pace in safety improvement
• Matured industries with stable and growing business, emphasize in knowledge sharing

Workers and management set the safety culture of an organization
Characteristics of a Positive Safety Culture

- Senior management shows “real” commitment to safety
- Mutual trust and an appropriate level of empowerment
- A “fair” blame culture
- Continuous organizational learning

- Proactive change management
- Care and concern for safety and health hazards and actively seeking effective measures to control those risks at all levels

Management actively lead by example
Role of Management

• Set safety objectives, safety strategic direction, and safety key performance indices
• Review safety performance against defined accountabilities
• Ensure availability of resources, define boundaries & respective authorities
• Ensure communication channels in place are effective
• Ensures obligations to stakeholders / shareholders are met
• Maintain oversight on internal controls
Styles of Management Oversight

- Each style has its pros and cons, and different levels of involvements
- Good safety performance can result from any style
- A company usually displays a style that reflects the mind-set of the Board but may not be aligning to its particular needs

There is no absolute “best” style, some companies adopt multiple styles
What is a Safety Management System?

• A planned, documented and verifiable method of managing hazards and associated risks
• It is a systematic, explicit and comprehensive process for managing safety risks
• As with all management systems, an SMS provides for goal setting, planning, and measuring performance
• A safety management system is woven into the fabric of an organization. It becomes part of the culture, the way people do their jobs. (Source: Wikipedia)
Evolution of Safety Management Systems

• Started with a haphazard collection of “best practice” activities for hazardous industries (prescriptive regulation before 1970s)
• Moved to a collection of practices to form the strategies by which an organization could demonstrate that all reasonably practicable steps are taken to ensure the safety and welfare of employees and others (organizational responsibility and self regulation from 1990s)
• SMS generates a safe system of work to exercise “duty of care”, and serves as a proof of diligence in legal or regulatory safety investigations

The drivers for the development of SMSs internationally had been catastrophic industrial accidents.
Development of a Safety Management System

- Regulatory bodies aggregated safety management activities that appeared to be “best-practice” or “common-sense” to provide comfort and security to organisations’ demand for guidance to meet the self-regulation
- Basic common attributes of an SMS include:
  - Identification of safety hazards
  - Remedial action to maintain safety performance
  - Continuous monitoring and regular assessment of safety performance
  - Continuous improvement of the overall performance of the SMS

SMSs regulated for managing catastrophic industrial accidents or generic workplace injury have similar overarching structures and major components
How Effective is an SMS on Safety Performance?

• “While most studies analysed demonstrated positive effects of components of a safety management system, there are a number of studies that failed to identify positive effects.”

• “The findings of one of the studies suggested that the effectiveness of the SMS might only be seen at the organizational level, rather than influencing the rate of unsafe acts.” (safety behavior)

• “This suggests that in high risk industries, there may well be little relationship between the factors influencing occupational health and safety outcomes, and performance in process safety.”

How Effective is an SMS on Safety Performance?

- “…no consistent findings were demonstrated with respect to performance on various dimensions of an SMS and poor safety outcomes from the perspective of low-probability but high-consequence events in the major hazard process industries”
- “…there have only been a small number of quality empirical evaluations of SMSs and it is unclear as to whether any individual elements of a SMS have a stronger influence on safety over other elements, although management commitment and appropriate safety communications do affect attitudes to safety.
- “In a study from the UK offshore oil and gas industry which utilized objective safety performance data, 1. management commitment; and 2. health promotion and surveillance were found to be associated with decreased accident rates.”

How effective is an SMS on safety performance?

• “…it just might be the case that the ever growing list of components of an SMS may well result in dilution effort across the spectrum of safety management activities. This dilution of effort may well result in poorer safety performance as the critical components receive less time and effort…”

  “…there is no clear objective empirical evidence as to whether there are any critical elements, …”

  “…the effectiveness of SMSs may well not lie in specific components of the system, but rather in the level of sophistication and effort applied across the system as a whole.”

Key Elements of Common Standards

Planning
- Setting policy
- Organising
- Identification & Assessment
- Procedures

Performance
- Communication
- Employee participation
- Acceptance monitoring

Assessment
- Active monitoring
- Reactive monitoring

Improvement
- Review
- Continual improvement

Plan

Act

Check

Do
System Approach of Common Standards
## System Approach of Common Standards – Target Setting

<table>
<thead>
<tr>
<th>Targets</th>
<th>Arrangements for Performance Evaluation</th>
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<tbody>
<tr>
<td>• A specific reduction in the number of accidents, incidents and cases of work-related illness</td>
<td>• Health surveillance</td>
</tr>
<tr>
<td>• A reduction in the level of sickness absence</td>
<td>• Accident and illness reporting and investigation procedure</td>
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<td>• Catering and food hygiene procedures</td>
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Safety Management Standards

ILO-OSH
- Guidelines on OS&H management systems, applied on national or organizational level
- aligns closely with HSG 65 and BS 8800:2004 but has greater emphasis on employee involvement and national legislation compliance

HSG 65
- A guide published by HSE, used for auditing employers
- promotes actively managing H&S systematically (within the context of managing the whole business) and raises the importance of leadership and employee involvement; more concerned with continual improvement

BS 8800
- A guidance standard, based on the structure of HSG 65
- give detailed specifications for the design of a management system with intent and basic requirements same as OHSAS 18001

OHSAS 18001
- An accredited standard for OH&S management, aligns quite closely with HSG 65, BS 8800, and ILO OSH 2001
- Gives more emphasis on health, addresses management of change explicitly
Safety Management Standards

- **ILO-OSH**
  - Policy
  - Organizing
  - Planning & Implementation
  - Evaluation
  - Action for Improvement

- **HSG 65**
  - Policy
  - Organize
  - Plan & Implement
  - Measure Performance
  - Review

- **BS 8800**
  - Initial Status Review; Policy
  - Organizing
  - Planning/Implementing
  - Performance Measurement; Investigation & Response
  - Audit; Reviewing Performance

- **OHSAS 18001**
  - Policy
  - Planning
  - Implementation & Operation
  - Checking & Corrective Action
  - Management Review

- **ISO 45001**
  - Context of the organization; Leadership & Commitment
  - Planning
  - Support; Operation
  - Performance Evaluation
  - Improvement
Key: Management of Change

- Leadership role in a change
- Involvement of stakeholders from the beginning of an expected change
- Promotion and communication
- Minimizing the introduction of new hazards and OH&S risks as the change occurs
SMS in 2028

- A bigger switch to health and wellbeing as some of those higher risks are removed through automation?
- More distributed workforce, remote working in homes, self-driven cars and multiple locations via online platform without a structure interaction?
- New emerging risks for working with cobots (collaborative robots) and emergency fixing them when they go down?
- Change in health and safety roles when shifting from humans to intelligent systems (e.g.; AI tool for automatic real-time recognition and reporting of hazards)

Be Resilient – be Water
Something to Think About

- Can we demonstrate reduction in accident occurrence within an industry or an organization is due to implementation of the SMS?
- What characteristics of SMS that are most related to the quality of an organization’s safety management?
- “SMSs represent an accumulations of a wide range of common-sense interventions, and such accumulations have a tendency to continually grow.” Is there any dilution effect by adding more components to an SMS?

An SMS is only as good as its implementation

Competence and safety from the heart is the driving force for excellent performance
Total Safety Culture

- Safety is a way of life – a process, not a program
- This is not something extra to do
- Safety should be incorporated into how we do everything:
  - Production
  - Quality
  - Efficiency (controlling costs)
- You can be a safety leader in your workplace
- Encourage others to live safety as a core value that will not be compromised
Total Safety Culture

- The importance of “moving safety to the next level”
- Continuing to do what you have always done has gotten you to the point you are at today
- If you want to keep getting what your getting, keep doing what your doing
- To move safety to the next level, you must do something different
- Rules, guards, and procedures only HELP keep us safe – it is up to each of the workers to develop a personal commitment to safe behaviour

Safety must be in the heart and mind of everyone, everywhere, everyday
Safety management is both an art and a science, guide by your heart and passion, with your competence and professionalism as the foundation.
IOSH in brief
The professional body leading the way

• More than 47,000 members in over 120 countries.
• 60 Networks across industry sectors and in different parts of the world
• The voice of the profession – led by our Presidential team
• 160,000 people trained to IOSH standards each year in over 70 countries
• Our vision: a safe and healthy world of work
• Mission: to be the professional body leading the way in global occupational safety and health
Why Join IOSH?

• Our members are internationally recognised as the benchmark for professional excellence in OSH
• Maximise your potential with CPD and IOSH Blueprint
• Enhance your knowledge
• Build your network and connections
• Local branches in the UK, Ireland, Asia Pacific, the Caribbean and the Middle East
• Our sector specific groups span a wide range of industries from aviation to sports grounds and events
• Join the debate on our social media platforms and website forums
• The IOSH technical information service includes high quality guides, toolkits plus an array of online resources like the OSH Research Community
Advancing your Organisation

The business benefits of employing IOSH members

- Good safety and health is good for business
- Improve employee engagement and productivity
- Strengthen your reputation as a high quality employee
- Recruit and retain the best.
Your journey with IOSH starts here

Your paths to career progression and success

Affiliate Membership

Assessment of qualifications and experience

Associate Membership (AIOSH)

2 years’ experience

Technical Membership (Tech IOSH)

Additional learning

Graduate Membership (Grad IOSH)

Chartered Fellow (CFIOSH)

Chartered Member (CMIOSH)
How do I get started?

Initial Professional Development

• To register, call our Customer Service Centre on +44 116 257 3198
• The cost to register is £160.00
• Two years to complete the assessment process
• 24 hours to activate your IPD record
• A welcome email sent within two hours
• Guidance document available when you have registered
APOSCHO 33
Driving OSH excellence through communication and collaboration
Regal Kowloon, Hong Kong
4-5 December 2018

Sponsorship and Exhibition opportunities
• Raise brand awareness
• Position your brand alongside one of the largest international not-for-profit safety and health organisations in the world
• Make new connections and build new partnerships with global occupational health and safety practitioners, leaders of organisations, policy makers and students.
• Explore business opportunities in the Asia-Pacific region
• High brand visibility throughout the conference
• Be part of the conversation on innovations in the OSH practices
A Scholarship for Students Studying Engineering at UCLA in Risk Management

1:1 matching for every dollar you donate to the scholarship (up to $100k)

Without Risk, there is no opportunity