

Risk Management and Insurance

Breaking Barriers, Paving Pathways

Ajaccio, September 18, 2009

OUTLINE

- ❑ Introduction – Andrei V. Tchouvelev, AVT
- ❑ Industry Perspective:
 - ✓ Anne Marit Hansen, StatoilHydro
 - ✓ Sam Miyashita, ENAA
- ❑ Insurance Companies Perspective:
 - ✓ Guy Vercauteren, FM Global
 - ✓ Bob Golden, Allianz Corporate Solutions
- ❑ Panel Discussion – Sergey Dorofeev, FM Global

Safety and Risk

❑ Definitions:

- ✓ Safety is freedom from unacceptable risk (ISO/IEC Guide 51:1999)
 - ***There is no zero risk or absolute safety***
- ✓ Risk (*acceptance*) criteria – terms of reference by which the significance of risk is assessed (ISO / IEC Guide 73: 2002)

❑ Limbo Dancing (courtesy of Les Shirvill, Shell Global Solutions)



Set the bar (acceptance criteria) first and then quantify the risks (QRA).

If the quantified risks don't get you below the bar, don't bend over backwards (fiddle the inputs to the QRA) to get beneath the bar! That's Limbo Dancing!

Risk Management and Insurance

□ Definitions (ISO / IEC Guide 73: 2002):

- ✓ Risk management generally includes risk assessment, **risk treatment**, risk acceptance and risk communication
- ✓ Risk treatment measures can include avoiding, optimizing, **transferring** or retaining risk (ISO / IEC Guide 73: 2002)
- ✓ Risk transfer – **sharing** with another party the **burden of loss** or benefit of gain, for a risk (ISO / IEC Guide 73: 2002)
 - Note: risk transfer can be carried out through **insurance** or other agreements.

Perception of Transferred Risk *Realistic Perspective*



You'd better be sure it works

Perception of Transferred Risk *Overconfident Perspective*



Perception of Transferred Risk *Overconservative Perspective*



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Insurance and Hydrogen Economy:

- ✓ Insurance is a major component of our everyday lives (e.g. auto, home, life insurance)
- ✓ It will remain a major component in the hydrogen-based economy too!

Today's Reality:

- ✓ Mainstream insurance industry at large is not aware of the progress of hydrogen and FC technologies and their market readiness
- ✓ Lack of data, lack of communication, lack of interest, anecdotal evidence of overconservative approach to risk transfer for new applications

Breaking Barriers:

- ✓ Outreach to insurance industry: start dialogue, share information
- ✓ Insurance internal hydrogen R&D needs to be coordinated with international academia and industrial hydrogen R&D safety programs

Paving Pathways:

- ✓ Shared understanding of generic hazards and approach to identification of representative realistic failure scenarios
- ✓ Use of common risk acceptance and harm criteria
- ✓ Use of appropriate risk assessment tools based on science, and
- ✓ Risk-informed insurance decision-making

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