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The role of companies in securing the transport of dangerous goods by road

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Agenda

Introduction

- 1 Transportation of Dangerous Goods by Road
- 2 Description of the goal: HR risk management
- 3 Methods to reach the goal
- 4 Development of the algorithm for HR risk management
- 5 Measures to the risk reduction
- 6 Verification of the procedure

Conclusion



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- Company: CDV – Transport Research Centre, Czech Republic
- Field of study: dangerous goods transportation
- Activities: research, training, counselling
- Cooperation with Ministry of Transport and BESIP



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1. Transportation of Dangerous Goods by Road

- Dangerous goods definition (ADR)
- Usage of dangerous goods
- Transport related risks
- Risk assessment for road transportation



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2. Description of the goal: HR risk management

- Comprehensive process of dangerous goods transportation
- Human factor - main cause of accidents and incidents
- Necessity to identify critical procedures
- Procedure must be embracing, structured, quantifiable and easy to implement and assess



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3. Methods to reach the goal (1/3)

Risk identification

- Check-list
- What-if Analysis
- FMECA (Failure Modes and Effects and Criticality Analysis)
- HRA – (Human Reliability Assessment)



3. Methods to reach the goal (2/3)

Estimation of the risk frequency

- FTA (Fault Tree Analysis)

Impact analysis of the risk

- Vulnerability indexes
- SW QRAM, ALOHA, QGIS



3. Methods to reach the goal (3/3)

Risk assessment

- Determining the acceptability of risk
- Determining the ALARP zone
- Calculation of the probability function



Agenda

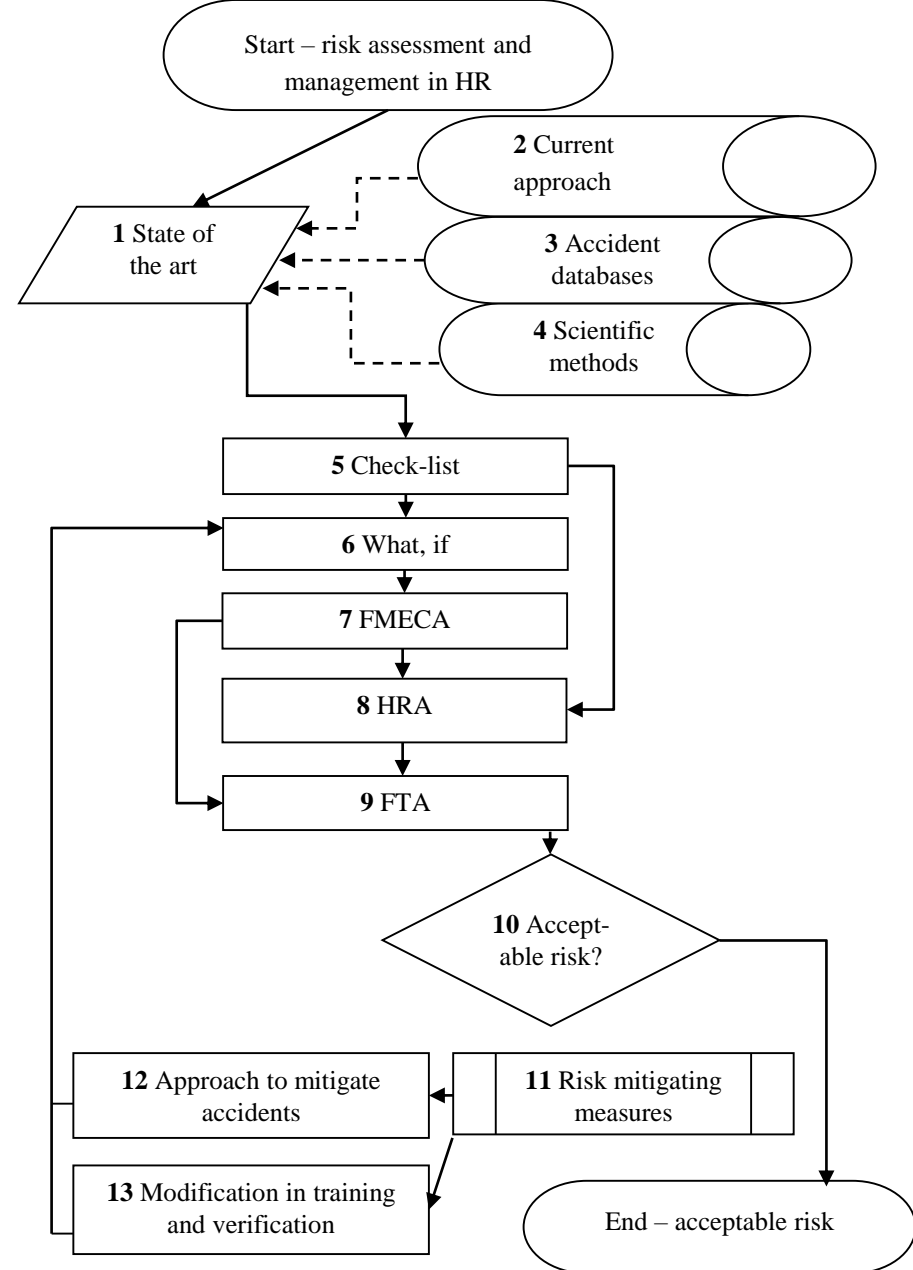
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4. Development of the algorithm for HR risk management (1/7)



4. Development of the algorithm for HR risk management (2/7)

Check-list

- Human factor
- Transport infrastructure
- Vehicle
- Packaging
- Specific



4. Development of the algorithm for HR risk management (3/7)

What-if Analysis (1/2)

- Handling during loading or unloading
- Driving a vehicle
- Management
- Inspection
- Technical failure of the vehicle accessories.



4. Development of the algorithm for HR risk management (4/7)

What-if Analysis (2/2)

- Suitability of packaging
- Quality of packaging
- Marking of packaging
- Misconduct of another participant
- Another unpredictable event



4. Development of the algorithm for HR risk management (5/7)

FMECA: Categorization of Event Severity

- Occurrence of failure
- Detection of failure
- Consequences of failure
- Setting eligibility criteria



4. Development of the algorithm for HR risk management (6/7)

HRA – (Human Reliability Assessment)

- Identification of human operations
- Determination of error rate for each operation
- Determining the impact of human errors on the process
- Recommendations for the process modification



4. Development of the algorithm for HR risk management (7/7)

FTA – (Fault Tree Analysis)

- Definition of a peak undesirable event
- Classification of sub-events
- Allocation of logical members
- Determining event probabilities



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5. Measures to the risk reduction (1/2)

Measures to reduce the risk of traffic accidents

- Human factor
- Vehicle
- Infrastructure



5. Measures to the risk reduction (2/2)

Modifications in training and knowledge verification

- Driver training for ADR certification
- Internal training for ADR drivers
- Verification of driver knowledge



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6. Verification of the procedure

Validation of the procedure in transport company

- Identification of the risk areas
- Identification of an unacceptable level of risk
- Implementation of risk mitigation measures



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Prerequisites for successful risk management

- Identification, quantification, evaluation, implementation
- Role of dangerous goods advisor
- Communication with company management





Thank you for your attention.

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