Transportation Risk Management

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Risk = Probability x Consequences
Risk Management Approach

- Proactively plan, assess, and improve the risk management process

- Integrate past, current, and future risk management activities
Transportation Risk Management Mission

"To enhance public safety by reducing or mitigating risks to health and the environment"
Transportation Risk Management Process

Risk Communication/Stakeholder Interface

Risk Identification

Risk Assessment

Risk Reduction

Risk Monitoring
Risk Management Communications Model

Inputs
- Stakeholders
- Science and Technical
- Economic
- Political
- Social
- Legal
- Government Agencies
- Business

Message ➔ Decision Maker ➔ Message

Channel ➔ Channel

Feedback

Outputs
- Stakeholders
- Media
- Regulatory
- Public
- Science and Technical
- Government Agencies

Civilian Radioactive Waste Management System
Management & Operating Contractor
Risk Identification

Risk Communication/Stakeholder Interface

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Risk Identification

“Incorporating scientific knowledge and societal values”

Stakeholders

Engineering Modeling and Simulation

Statutory Regulatory

Experience Literature Experts

Civilian Radioactive Waste Management System

Management & Operating Contractor
Risk Assessment

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Civilian Radioactive Waste Management System
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Risk Assessment

Data Acquisition

- Seismic Assessments
- Cask Studies
- Human Factors Analysis
- Radiological Assessments
- Systems Safety
- Accident Rates
- Routing Models
- RISKIND RADTRAN
- Infrastructure Analysis
- Railway Data
- Motor Carrier Safety
- MPC Risk Assessments

+ Risk Analysis Methodologies

- Hazard and Operability Analysis
- Event Tree Analysis
- Life-Cycle Cost Analysis
- Cost-Effectiveness Analysis
- Benefit-Cost Analysis
- Systems Reliability Analysis
- Fault Tree Analysis
- Network Analysis
- Risk-Benefit Analysis
- Socio-Economic Analysis

Risk Assessment
Risk Assessment Activities

- Environmental reports
- Technical activities
- Computer modeling and data acquisition
- System benchmarking
Risk Reduction

- Design recommendations
- Policies and procedures
- Training, inspections, and certification
- Performance standards
- Maintenance protocols
Risk Reduction Through Human Factors Engineering

Current Activities:

- Ongoing research of existing studies and reports on human factors engineering (HFE) and transportation through database searches and a literature review

- Analysis of those reports that are applicable to CRWMS and examination of design and operational recommendations
Risk Reduction Through Human Factors Engineering

Current Activities:

- HFE design requirement in multi-purpose canister (MPC) statement of work
- HFE review in GA-4/9 cask design
- Driver performance evaluation of light weight truck cab configuration
Risk Monitoring

Risk Communication/Stakeholder Interface

- Risk Identification
- Risk Assessment
- Risk Reduction
- Risk Monitoring

Civilian Radioactive Waste Management System
Management & Operating Contractor

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Risk Monitoring

- Transportation risk management database
  - Follow-up reviews
  - Inspections
  - Performance assessments
Transportation Risk Management and the GA-4/9 Tractor Trailer
Transportation Risk Management and the GA-4/9 Tractor Trailer

Risk Communication:

- Open forum for risk identification
- Open access to data and assumptions
- Open access to assessment methodologies
Transportation Risk Management and the GA-4/9 Tractor Trailer

Risk Identification:

- Historical precedence
- Engineering standards
- Stakeholder concerns
- Professional society interactions
Transportation Risk Management and the GA-4/9 Tractor Trailer

Risk Assessment:

- ANSYS design modeling
- durability demonstration
- Performance testing
- Track assessment
- Human performance evaluation
- Over-the-road testing
Transportation Risk Management and the GA-4/9 Tractor Trailer

Risk Reduction:

- Design standards (ANSI N14.30)
- Design recommendations
- Policies and procedures
- Driver training, certification, and qualification
- Inspection standards
Transportation Risk Management and the GA-4/9 Tractor Trailer

Risk Monitoring:

- Ongoing evaluation of driver performance
- Regular follow-up assessments
- Routine inspections