Working Safely in Hazardous Environments—Challenges and Solutions

Waste Management '08

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The Point

- Change May Introduce New or Different Hazards

- Integrated Safety Management is the Consistent Effective Approach

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The Problem

Traditional Methods of Hazard Control May not be Effective for Changing Workplaces

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Ch, Ch, Ch, Changes!

- Over Two Decades
- Significant Changes in Federal Workplaces
- Warrant Critical Analysis of Previous Hazard Control Methods

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Mission Changes

Operation/Production to Cleanup/Demolition

- Controlled Environment to Unexpected Conditions
- Tested Procedures to Innovative Thinking
- Routine Surveillance to Transient and Temporary Work Methods

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Technology Changes

40 KB Hard Drive to 800 KB Presentation

- Power Electronics that Generate Mega-Joules of Energy
- Unique Decontamination Exposures
- Powerful Demolition Equipment

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Interface Changes

Isolation to Global Economy

- Counterfeit Material
- No NRTL Listings
- Biological Hazards (Bird Flu)

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Culture Changes

A Working Generation Replacement

- No Industrial Experience
- Military Discipline Techniques Outdated
- Tribal Knowledge Interrupted

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Requirements Changes

Move Toward National Standards

- 10 CFR 851
- OSHA
- NFPA Codes/Standards
- Conflicting Hazard Controls

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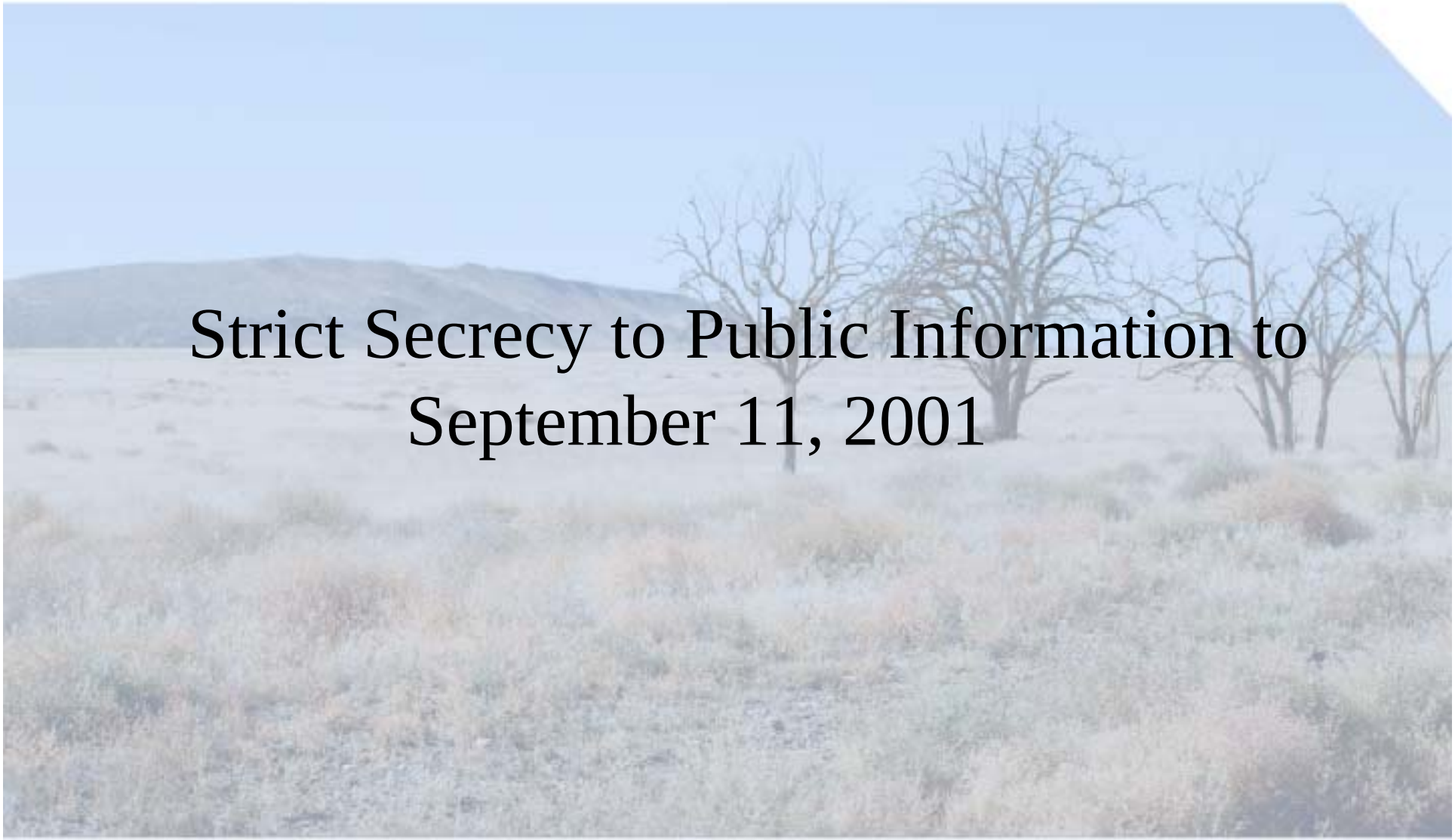
Security Changes



Strict Secrecy to Public Information to September 11, 2001

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Coping With Change

- Roll Down New Requirements into Field Procedure
- Use Installation Standards to Ensure Work Place is Safe for Casual Worker
- Clearly Define Scope of Assigned Task
- Analyze Potential Hazards

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Coping With Change

- Ensure Trained/Qualified Workers
- Design Adequate Controls
- Execute the Plan
- Feedback Opportunities to Continuously Improve the Process
  - Electrical Severity Index Tool

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Electrical Severity Index Tool

- Quantifies Electrical Events
- Weighted System
- Uses Both Direct and Indirect Factors
- Allows Consistent Tracking/Trending

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Electrical Severity Index Tool

Factors

- Electrical Hazard Factor (EHF)
- Environmental Factor (EF)
- Shock Proximity Factor (SPF)
- Arc Flash Proximity Factor (AFPF)
- Thermal Proximity Factor (TF)
- Injury Factor (IF)

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Electrical Hazard Factor

- Based on Voltage
- Based Type AC or DC
- Based on Power
- Hazard Analysis Chart
- Values: 0, 1, 10, 50, 100

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Environmental Factor

- Dry 0
- Damp 5
- Wet 10

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Shock Proximity Factor

- From NFPA 70E Table 130.2(C)
- Outside LAB 0
- Within LAB 1
- Within RAB 3
- Within PAB 10
- Derived Table for DC

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Arc Flash Proximity Factor

- Flash Protection Boundary from NFPA 70E 130.3(A)
- Outside FPB 0
- Inside FPB 10

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Thermal Proximity Factor

- R&D Environments
- Based on Power Exposure
- No Contact 0
- Contact ≤30 kW 3
- Contact >30 kW 10

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Injury Factor

- None 1
- Shock, 1st Degree Burn 3
- Arc Flash 2nd Degree Burn 5
- Shock Affecting Heart 10
- Permanent Disability, 3rd Degree Burn 20
- Fatality 100

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Formula

- Electrical Severity = EHF*(1+EF+SPF+AFPF+TPF)*IF
- 1-30 Low Significance Non-Reportable
- 31-330 Med Significance SC 4
- 331-3300 High Significance SC 3
- >3300 Extreme SC 1,2

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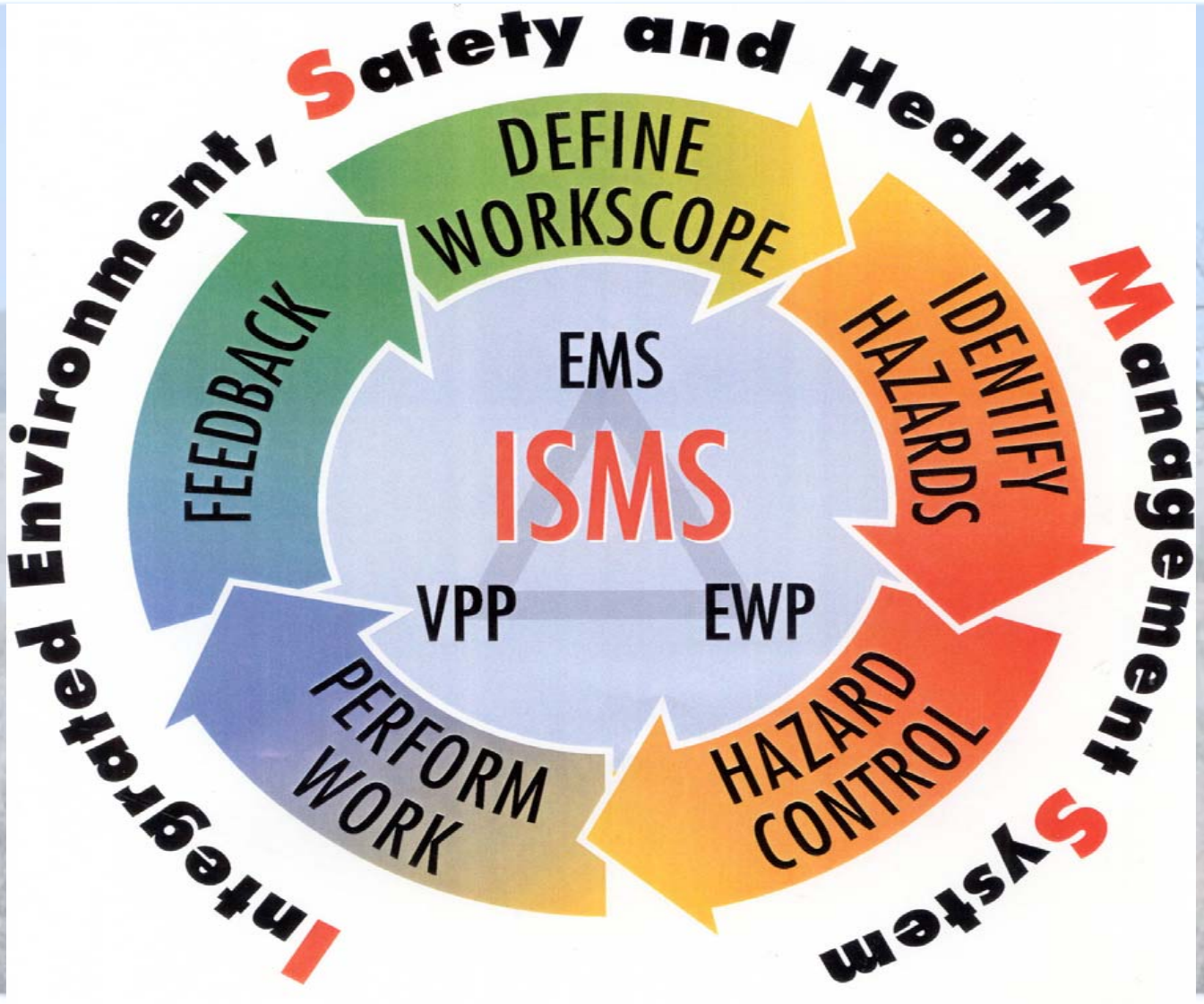
Coping With Change



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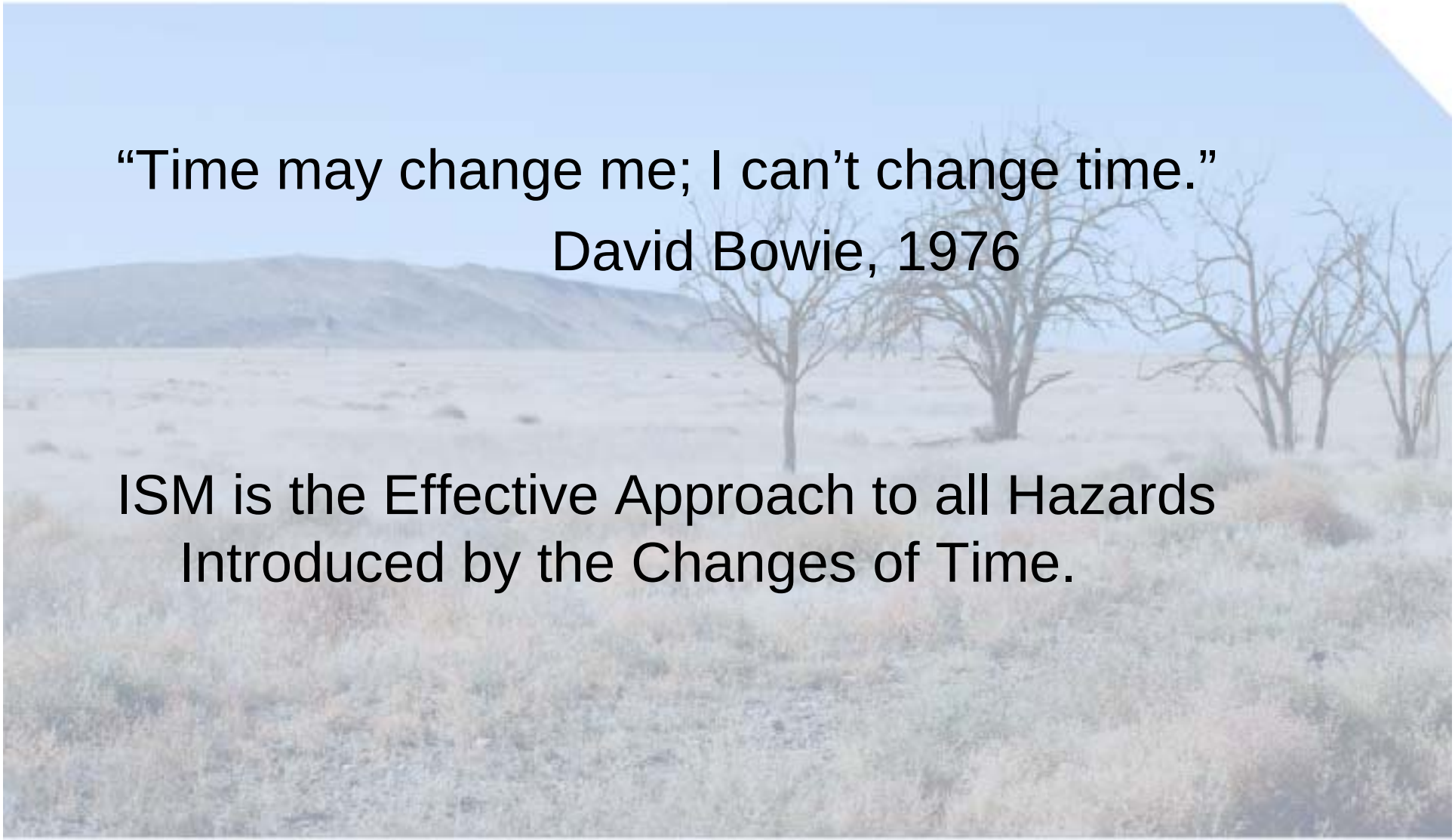
Conclusion



"Time may change me; I can't change time."

David Bowie, 1976

ISM is the Effective Approach to all Hazards Introduced by the Changes of Time.

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Questions/Comments?

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