

Management of Change

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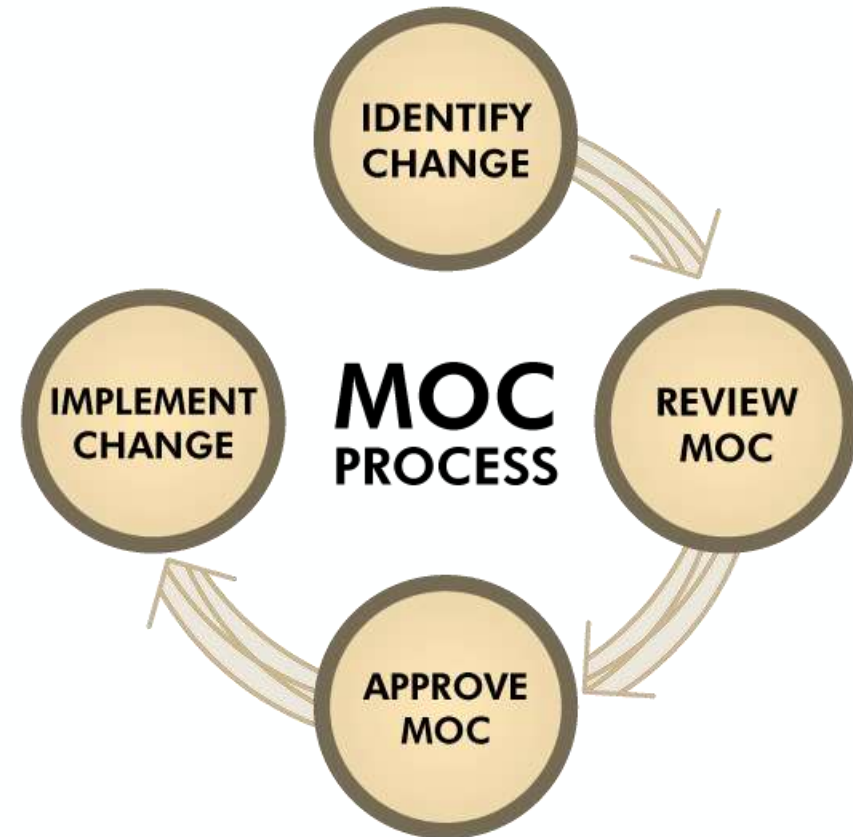
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INTRODUCTION

What is Management of Change (MoC)?

- A systematic and structured process used to manage safety, operational, environmental, and business risks associated with changes in high-hazard industries such as oil and gas, petrochemicals, nuclear power, pharmaceuticals, and chemical manufacturing.



Management of Change

Areas of Focus:

Changes to processes, equipment, materials, personnel, procedures, and organizational structure.

Industries of Significance:

- High-hazard industries (oil and gas, chemical, manufacturing)
- Healthcare facilities
- IT and cybersecurity
- Organizations undergoing significant change (mergers, acquisitions)

Goals:

- Ensure safety
- Maintain operational efficiency
- Comply with regulatory standards
- Mitigate risks



Types of MoC

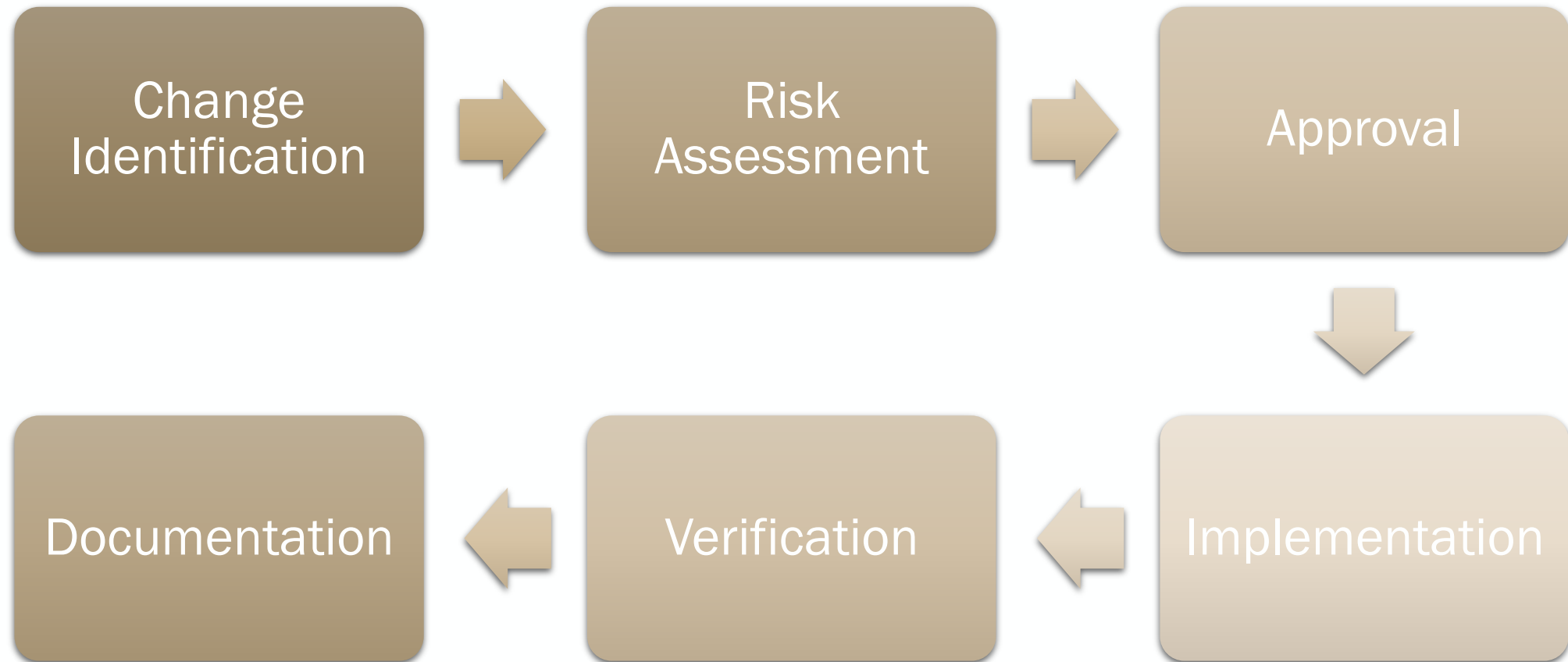
Comprises a broad range of modifications

- *Operational Changes*
- *Process Changes*
- *Material Changes*
- *Personnel Changes*
- *Organizational Changes*

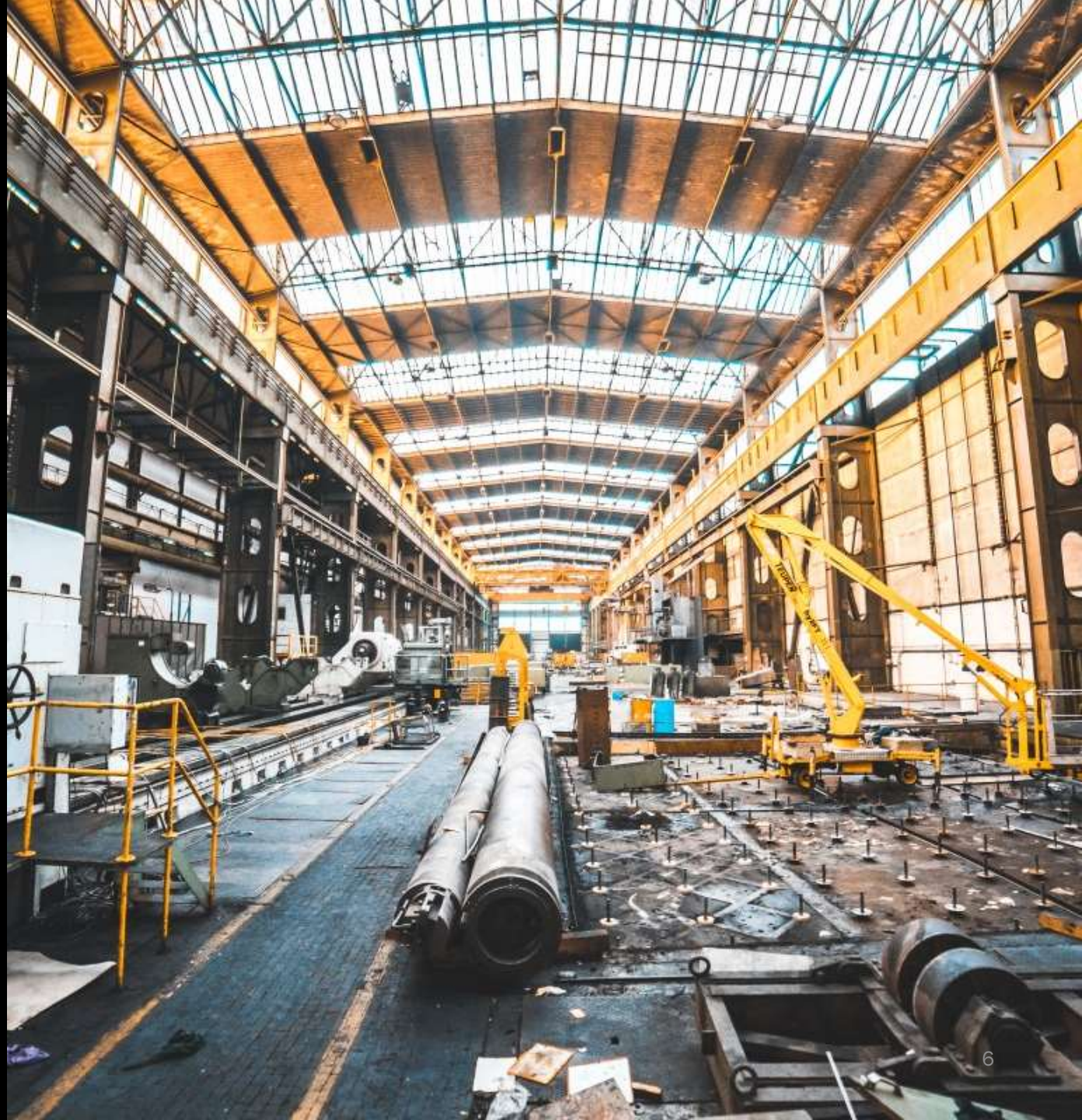


Steps in MoC

A systematic approach to evaluate and control changes before implementation.



Challenges and Consequences



Challenges and Consequences

- ❑ Safety Incidents
- ❑ Regulatory Non-Compliance
- ❑ Operational Downtime
- ❑ Reputational Damage



The Evolving Role of MoC

Adapting to Emerging Challenges

New technologies (automation, AI, digital transformation)

Increased regulatory compliance (environmental, safety)

Evolving workforce dynamics (multiple generations, contractors)

Crucial Aspects:

Risk assessment and mitigation for new technologies

Ensuring seamless integration of technology and human factors

Strengthening training and communication to maintain safety standards

Adapting to accommodate changing workforce needs.

Losses Through Time



Bhopal Case Tragedy, December 1984



- Technical Failures
- Lack of Management of Change (MoC) Framework
- Poor Maintenance
- Lack of Community Engagement
- Inadequate Training

Chernobyl Nuclear Disaster, 1986



- Failure to Assess Changes
- Miscommunication
- Inadequate Training

Piper Alpha Explosion, 1988



- Operational Transition
- Poor Communication
- Inadequate Documentation
- Simultaneous Operations

BP Texas City Refinery Explosion, 2005



- Inadequate Risk Assessment
- Poor Documentation
- Cultural and Organizational Failures
- Lack of Skilled Personnel

Deep Water Horizon, 2010



- Changes in Drilling Procedures
- Poor Communication and Documentation
- Organizational and Contractor Mismanagement

Recurring Themes in Major Incidents



Inadequate Risk
Assessment



Failure to Implement
Recommendations



Lack of Communication
and Collaboration



Lack of Skilled Workers

Recurring Themes in Major Incidents



Piper Alpha Oil Rig Explosion, 1988

Buncefield oil depot explosion, 2005



Deepwater Horizon oil spill, 2010

Port Neches explosion and fire, 2019



Recurring Themes in Major Incidents



Piper Alpha Oil Rig
Explosion, 1988

Failure to implement recommended safety improvements



Buncefield oil depot
explosion, 2005

Ignoring risk assessment findings



Deepwater Horizon oil
spill, 2010

Cost considerations led to disregarding recommendations



Port Neches explosion
and fire, 2019

Cost concerns and failure to address PHA recommendations

Factors affecting Risk Management



Culture



Cost



Compliance



Commitment

Emerging Operational Risks and Mitigation Strategies

Workforce and Operational Excellence

- Investing in Training and Development programs

Climate Resilience and Adaptation

- Climate risk assessments, strengthened infrastructure

Business Interruption (BI) Coverage

- Review and reassessment BI risks and exposures

Cyber Vulnerability

- Strengthening cybersecurity frameworks and Conducting employee training on cybersecurity awareness

Financial Losses Due to Incidents: A Growing Concern



Financial Losses



**DIRECT FINANCIAL
LOSSES**



**LEGAL LIABILITIES AND
SETTLEMENTS**



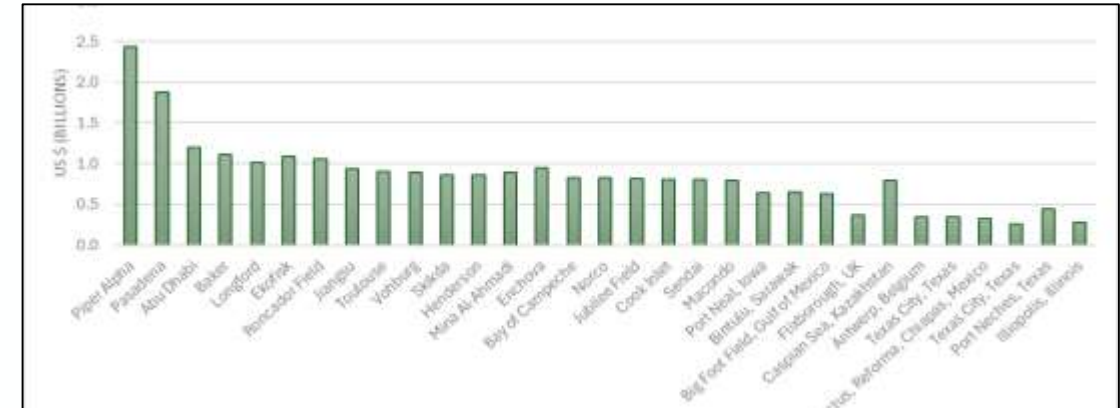
**INSURANCE PAYOUTS
AND PREMIUM
INCREASES**



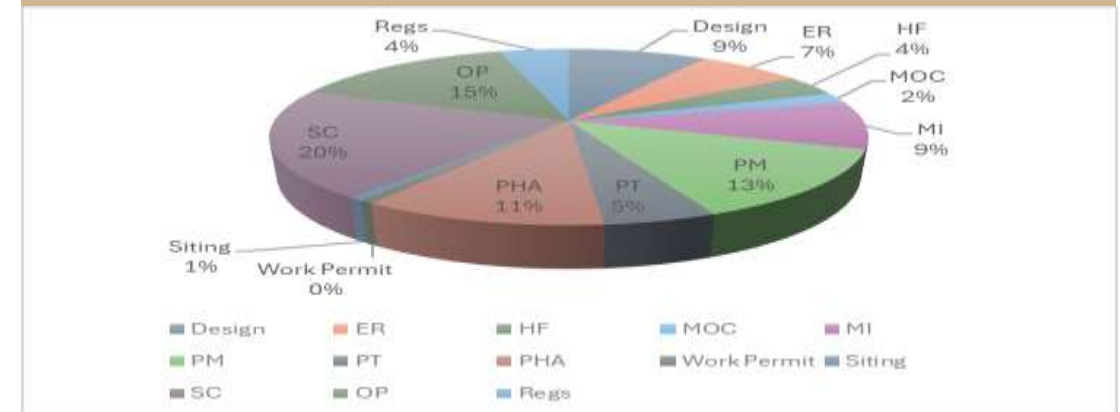
**DISRUPTION OF SUPPLY
CHAIN**

Financial impact of Industries

- Major industrial incidents caused multi-billion-dollar losses, highlighting significant financial risks.
- Key contributors include Safety Culture (20%), Operational Practices (15%), and Process Management (13%), revealing systemic weaknesses.
- Effective Management of Change (MoC) is critical for mitigating secondary risks and preventing compounding failures.
- Proactive risk management and safety-focused strategies are essential for long-term resilience and operational stability.



Incidents over the years vs Financial Impact



Factors contributing to the incidents

Business Impact

Shifting Priorities and Increased Costs

- Increased Focus on Risk Management
- The shift in Corporate Culture
- Innovation and Technological Investments
- Greater Regulatory Scrutiny and Compliance Costs
- Reputation Damage and Competitive Disadvantage



Evolution of MoC Over the Past Decade



Technological
Integration



Risk
Assessment



Stricter
Regulatory
Compliance



Cultural Shift



Cross-Industry
Standardization

Insights from Experts' Interviews



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Dwight Johnston
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Ex-VP HSE Offshore
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CCPS Lead Process
Safety Subject Matter
Expert

The Evolving Role of MoC in High-Hazard Industries

Technological Advancements

- Digital tools and automation have streamlined processes and improved compliance.
- AI and automation offer potential for increased efficiency, but careful integration is crucial.

Workforce Management

- Stakeholder involvement and effective communication are essential.
- Addressing employee reactions to change is crucial for successful implementation.
- Skill gaps and knowledge transfer need to be addressed.

Improved MoC Practices

- Structured frameworks for risk management and compliance monitoring.
- Multi-level assessments for complex changes.
- Emphasis on understanding the scope, urgency, and impact of changes.

Challenges and Future Outlook

Key Challenges

- Adapting to new technologies and managing workforce transitions while ensuring compliance

Human factors

- Employee resistance and documentation gaps require focused stakeholder involvement

Future Integration

- AI and automation will enhance efficiency but must balance with human oversight

Continuous Evolution

- MoC must adapt to dynamic risks and evolving technologies in high-hazard industries

Proposed Steps Forward

Enhancing MoC Practices: Technical and Organizational Aspects



Comprehensive Training



Technological Integration



Robust Documentation



Stakeholder Engagement

Proposed Steps Forward

Enhancing MoC Practices: Human Factors and Future Preparedness



**Advanced Risk
Assessment**



**Post-Change
Evaluation**



Safety Culture



**Future
Preparedness**

Conclusion

The Evolution of MoC

From Manual to
Digital

Industry
Standardization

Training and
Communication

Conclusion

Challenges and Future Directions

Addressing
Gaps

Leveraging
Technology

Human-
Centric
Approach

Continuous
Improvement

"To err is human"

– Alexander Pope



THANK YOU

