



# Challenges in Health, Safety, Security & Environmental Audits

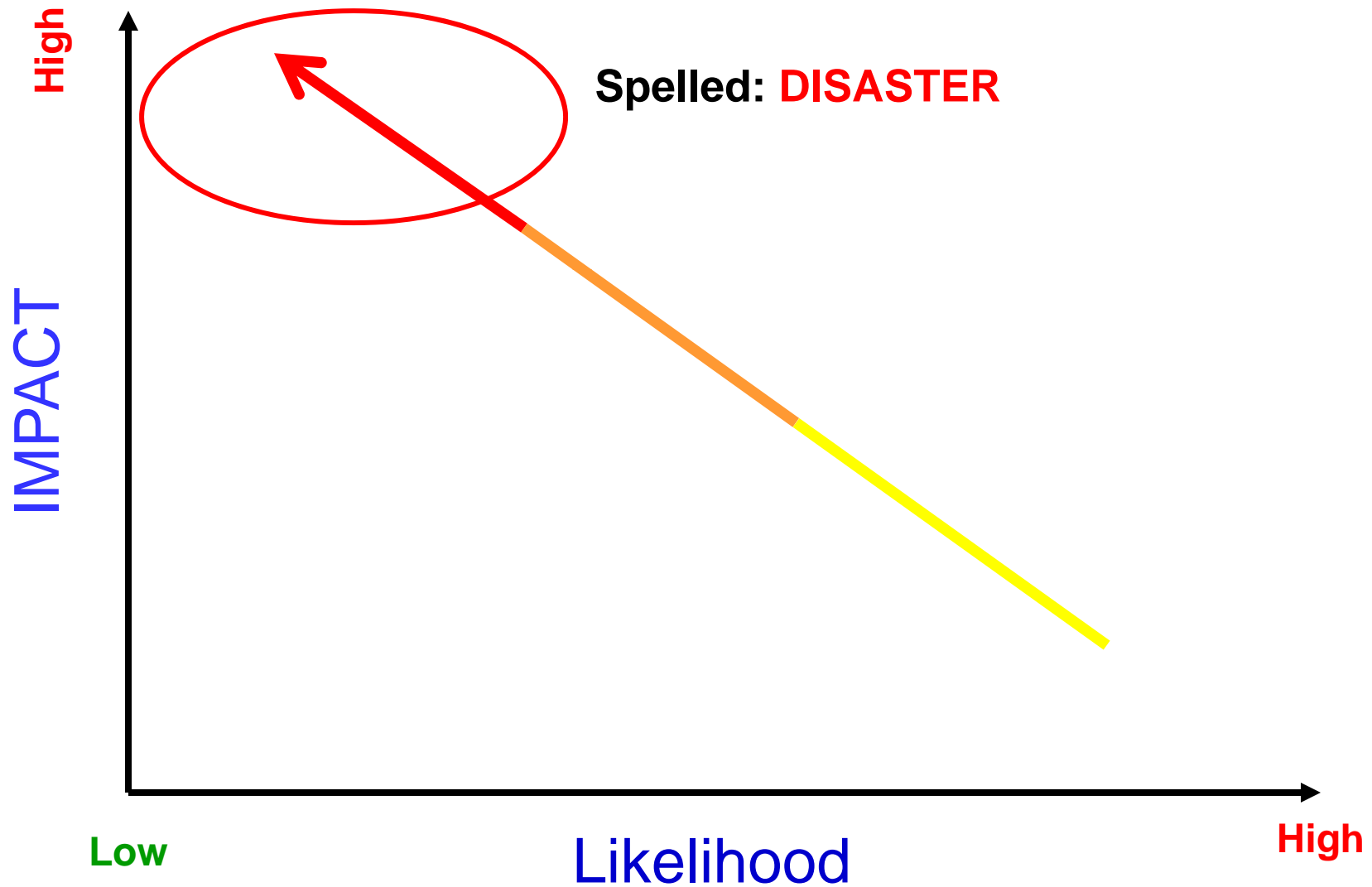
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## Challenges in HSSE Audits

- **Historical Perspective**
- **Why Audit HSSE?**
- **HSSE Audit – Intricacies**
- **Audit Methodologies & Techniques**
- **Emerging Issues & Trends**
- **Future Outlook**

# Risk Assessment – Probability vs. Impact



## Ixtoc I – 03 June 1979



## Ixtoc I – June 1979

- 
- **Owner: Pemex (Mexico)**
  - **Cause: Exploration Well Blowout**
  - **Spill: 2,800 KM<sup>2</sup> of Oil Spill**
  - **Damage: 3 Months of Oil Leakage at a Rate of 30,000BPD to 10,000BPD**
  - **10 Months to Cap**

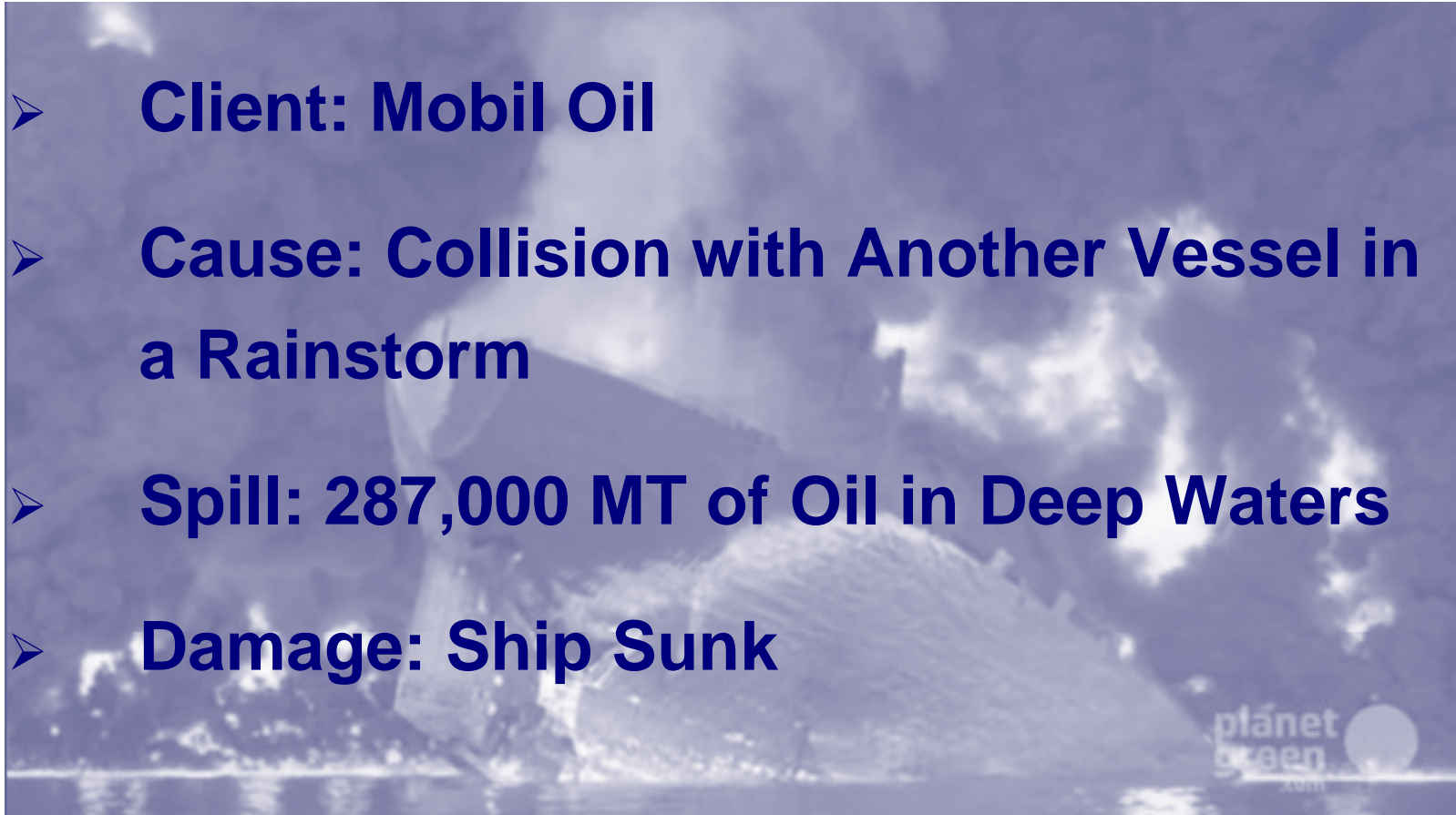
## Atlantic Empress – July 1979





## Atlantic Empress – July 1979

- **Client: Mobil Oil**
- **Cause: Collision with Another Vessel in a Rainstorm**
- **Spill: 287,000 MT of Oil in Deep Waters**
- **Damage: Ship Sunk**

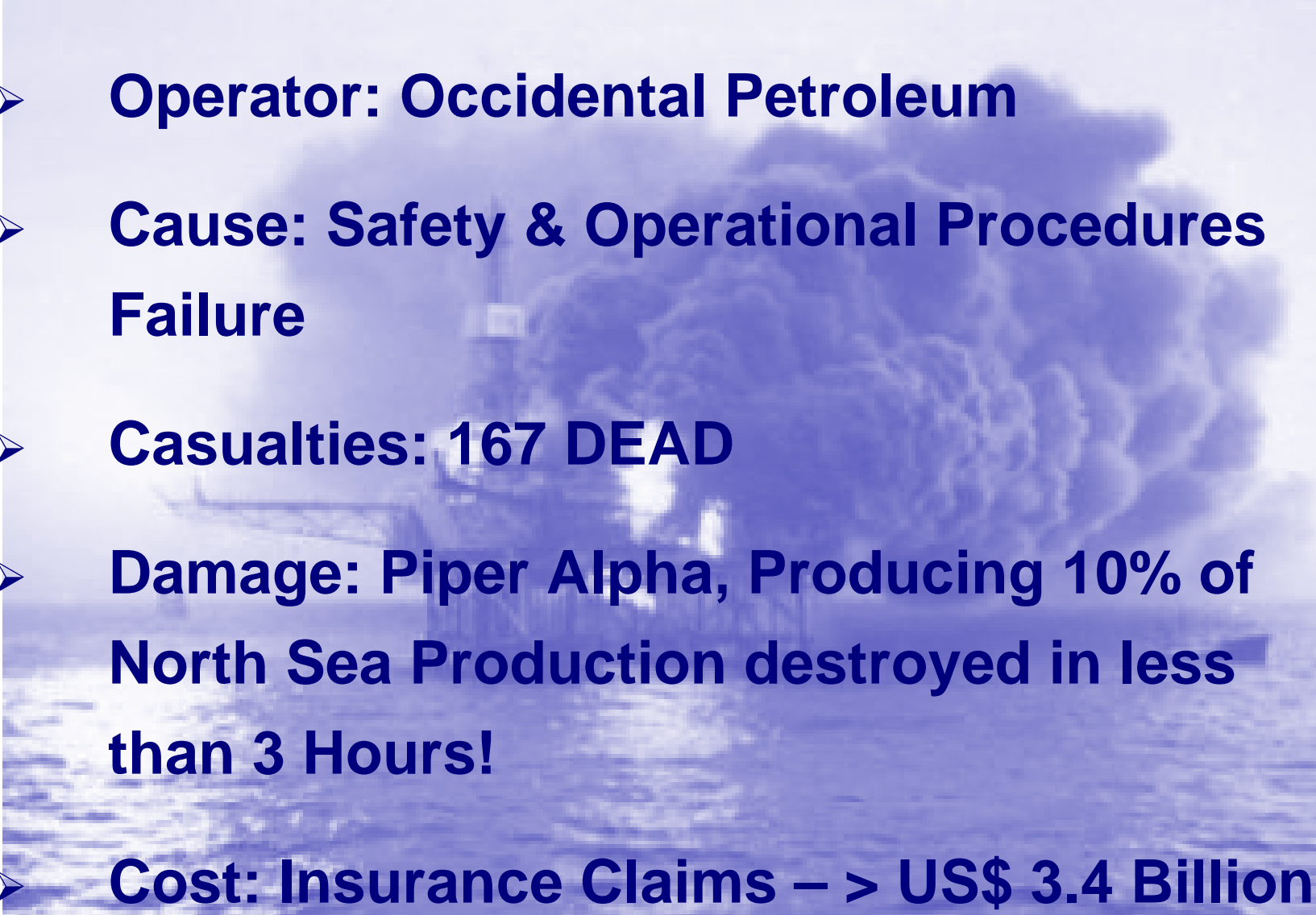


## Piper Alpha – July 1988





## Piper Alpha – July 1988

- 
- **Operator: Occidental Petroleum**
  - **Cause: Safety & Operational Procedures Failure**
  - **Casualties: 167 DEAD**
  - **Damage: Piper Alpha, Producing 10% of North Sea Production destroyed in less than 3 Hours!**
  - **Cost: Insurance Claims – > US\$ 3.4 Billion**

## Exxon Valdez – March 1989



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## Exxon Valdez – March 1989

- 
- **Operator: Exxon**
  - **Cause: Vessel Ran Aground**
  - **Oil Spill: Over 700,000 Barrels of Oil**
  - **Damage: Unprecedented Damage to wildlife & Environment Continues**
  - **Cost: Approx. US\$ 1.0 Billion in Damages**

## Deepwater Horizon – April 2010



# Deepwater Horizon – April 2010





## Deepwater Horizon – April 2010

- 
- **Operator: BP**
  - **Cause: Defective Cementing Job**
  - **Casualties: 11 DEAD, 17 Injured**
  - **Oil Spill: 4,900,000 Barrels of Oil Leaked**
  - **Damage: Largest Accidental Marine Oil Spill**
  - **Cost: Final Losses – Est. US\$ 12.0 Billion**

## Sidoarjo Mud Volcano – May 2006 to-Date



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## Sidoarjo Mud Volcano – May 2006 to-Date

- **Cause: Unprotected Casing**
- **Spill: 180,000 Meters<sup>3</sup> per Day of Mud Gushing Out – Expected to Continue for Another 25-30 Years!**
- **Damage: Several Hundred Square Miles Inundated and Rendered Inhabitable**
- **Cost: Hundreds of Thousands Displaced**



## **Elements of HSSE**

- **Health** – Workspace Environment (with Respect to Personal Safety Hazards), Medical Fitness & Record Maintenance, Healthcare Facilities
- **Safety** – Determining Appropriate Operational Standards, Maintenance Monitoring, Material Quality, Process Flows
- **Security** – Sabotage, Arson & Theft, Terrorism



## **Elements of HSSE**

- **Environment – Identification of Environment & its Vulnerabilities, Regulatory Framework, Adequacy of Protective Measures**



## **Complexities & Conflicts in HSSE**

- **Design Integration** – Operating Standards **MUST** be Determined and Built into Project Design
- **Global Implications** – A Very Broad Ambit Encompassing Several Operational Elements
- **Overlapping Domains** – Employee Health > HR, Safety > Operations, Security > Administration, Environment > CSR
- **Budgetary Constraints** – An Expensive Proposition



## **Determining (Minimum) HSSE Standards**

- **Planning for Hazard Identification, Risk Assessment and Risk Control**
- **Occupational Health, Safety and Standards Management Programme (BS 18001, ISO 14001, etc.)**
- **Structure and Responsibility**
- **Training, Awareness and Competence**
- **Consultation and Communication**
- **Management Reviews**



## **Determining (Minimum) HSSE Standards**

- **Operational Control**
- **Emergency Preparedness and Response**
- **Performance Measuring, Monitoring and Improvement**



## **Peculiarities of An HSSE Audit**

- **Scope Identification & Management Agreement**
- **Highly Specialized Skills-Set Required**
- **More Detailed Planning & Logistical Support**
- **Coordination & Procedural Issues with Sites**
- **Time Constraints Due to Exposure to Hazardous Environment**
- **Challenges in De-Briefing the Board (especially Audit Committee) in Less Technical Terminology**



## **Essentials for A Successful HSSE Audit**

- **Management Buy-In**
- **Value Proposition of an HSSE Audit – Short & Long-term**
- **Setting the RIGHT Scope**
- **Team Selection – Getting the RIGHT People Onboard**
- **Identification of Resources & Early Allocation**
- **Preparing the Auditees & the Facilities**



## **Essentials for A Successful HSSE Audit**

- **Preparation of A Sound Pre-Read**
- **Logistical Planning – Scheduling & Availability, Permits & Logistical Arrangements**
- **Regular Iteration of ALL Findings with Site Management to Ensure Buy-in**
- **Prioritization – Leave the LOW Risk Items for the Site Management**
- **Appropriate Follow-up Audits**



## **Essentials for A Successful HSSE Audit**

➤ **MOST IMPORTANT**

**Do NOT Forget to Say**

**THANK YOU**



## Emerging Issues

- **Environmental Impacts – Shift in Focus**
- **Global Terrorism – An Unprecedented Menace**
- **Un-Moderated Media Coverage of Incidents**
- **Keeping up with Technological Advancements**
- **Political Turmoil & International Peace**



## The Future Outlook

- Independence of HSSE – From Operations & Maintenance
- Direct Board Oversight – HSSE Should be Allowed to Present Its Own Findings
- Organizational Standards – Develop Specific and Pragmatic Standards & Procedures to Gauge HSSE

**With the Above Achieved, HSSE Function Itself  
Would Become A Specialized Independent Audit**



*Thank You*  
&  
*Good Luck*