

Decision Support for Dynamic Barrier Management- Summary of JIP

IADC DEC Forum

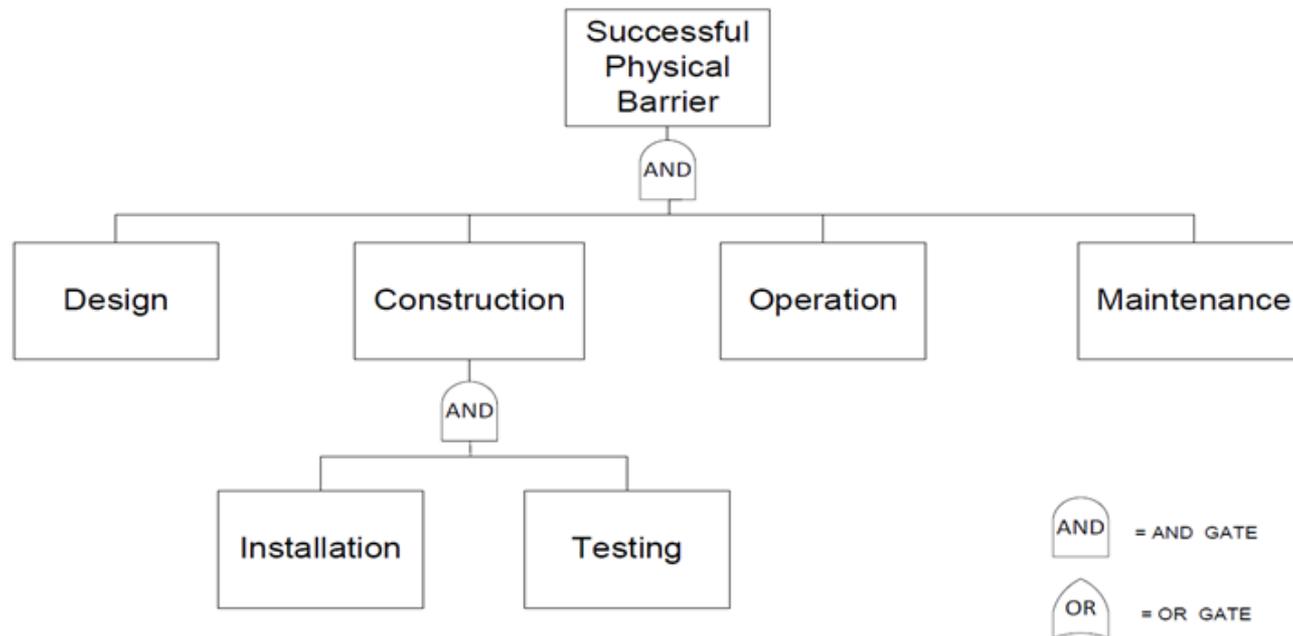
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Background – similar approaches

Argonne National Laboratory – Multiple Physical Barrier (MPB)

DNV – GL – Bowtie Diagrams with Success Paths

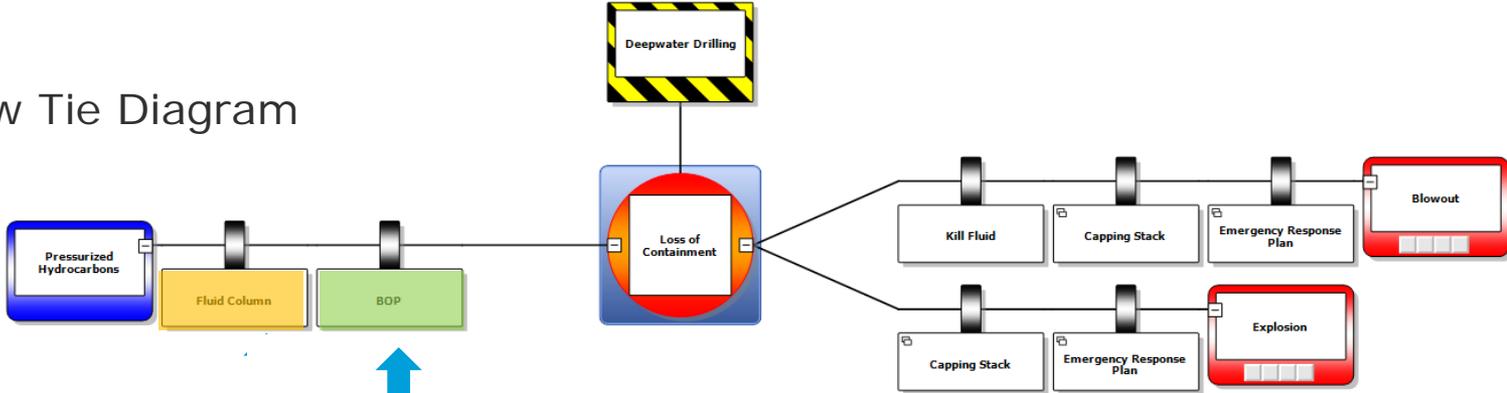


The success path model is a systematic way to identify the key functions and elements needed to ensure the success of a given objective /physical barrier.

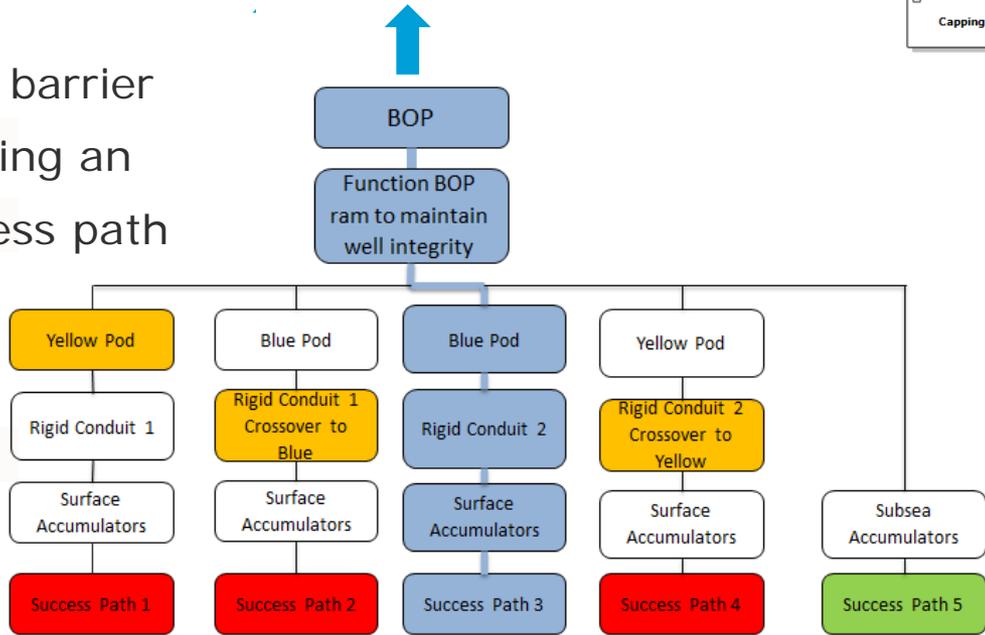
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Bow tie diagrams and response trees form the foundation for decision support for dynamic barrier management

Bow Tie Diagram



THEN the BOP barrier is activated using an available success path



Key:

Recommended Success Path	Path Name Priority
Available Success Paths	Path Name Priority
Unavailable Success Paths	Path Name Priority
Failed Element	Failed Element

Objective, Scope & Participants

- **Objective**
 - ✓ **Assess value of barrier-success path approach**

- **Scope**
 - ✓ **Select well integrity scenario for case study**
 - ✓ **Conduct workshops to apply approach**
 - ✓ **Capture Lessons Learned**

- **Participants:**
 - ✓ ***Operators:*** Shell, Hess, ConocoPhillips, Maersk Drilling, Total, PEMEX
 - ✓ ***Drilling Contractors:*** Diamond Offshore, Transocean
 - ✓ ***Service Contractors:*** Schlumberger, Baker Hughes
 - ✓ ***Regulators:*** BSEE, SENER, PSA

Results

- **Success Paths developed for P&A case (design, install & test)**
- **Regulatory compliance tree for P&A (30 CFR 250.1715)**
- **Final Report issued in 2017**
- **Published on BSEE website**

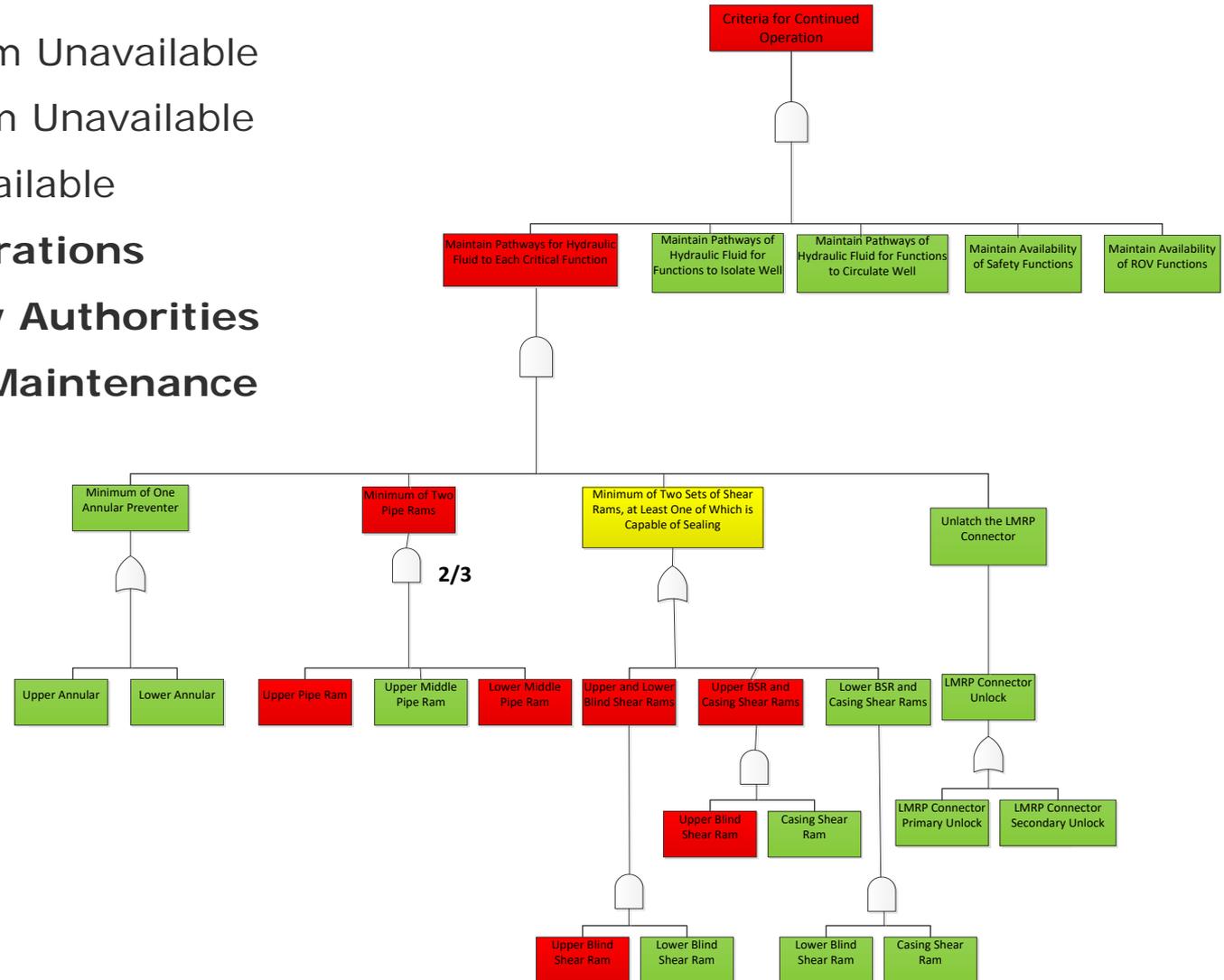
<https://www.bsee.gov/research-record/risk-based-evaluation-of-offshore-oil-and-gas-operations-using-a-multiple-physical>

- **Feedback**
 - ✓ **Common/simpler framework for communication & consensus- fewer ways to succeed than fail**
 - ✓ **Useful for developing operating procedures**
 - ✓ **Pre-identify alternatives & secure management approval in advance**
 - ✓ **Keep bowtie diagrams visually simple**

Regulatory Compliance Assessment During Operations: Decision Criteria for Drilling Operations Based on BOP Functionality

Upper Blind Shear Ram Unavailable
 Lower Middle Pipe Ram Unavailable
 Upper Pipe Ram Unavailable

- **Stop Drilling Operations**
- **Notify Regulatory Authorities**
- **Pull the BOP for Maintenance**



Key Future Areas of Collaboration

- Target areas for automation & sensor placement
- Common Dashboard for Improved communication and monitoring using the barrier-success path framework

Questions?

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