SPE 89632
Further advances in coiled tubing floater operations

Alastair Buchanan

Schlumberger Well Services North Sea
Coiled Tubing Services Geomarket Engineer

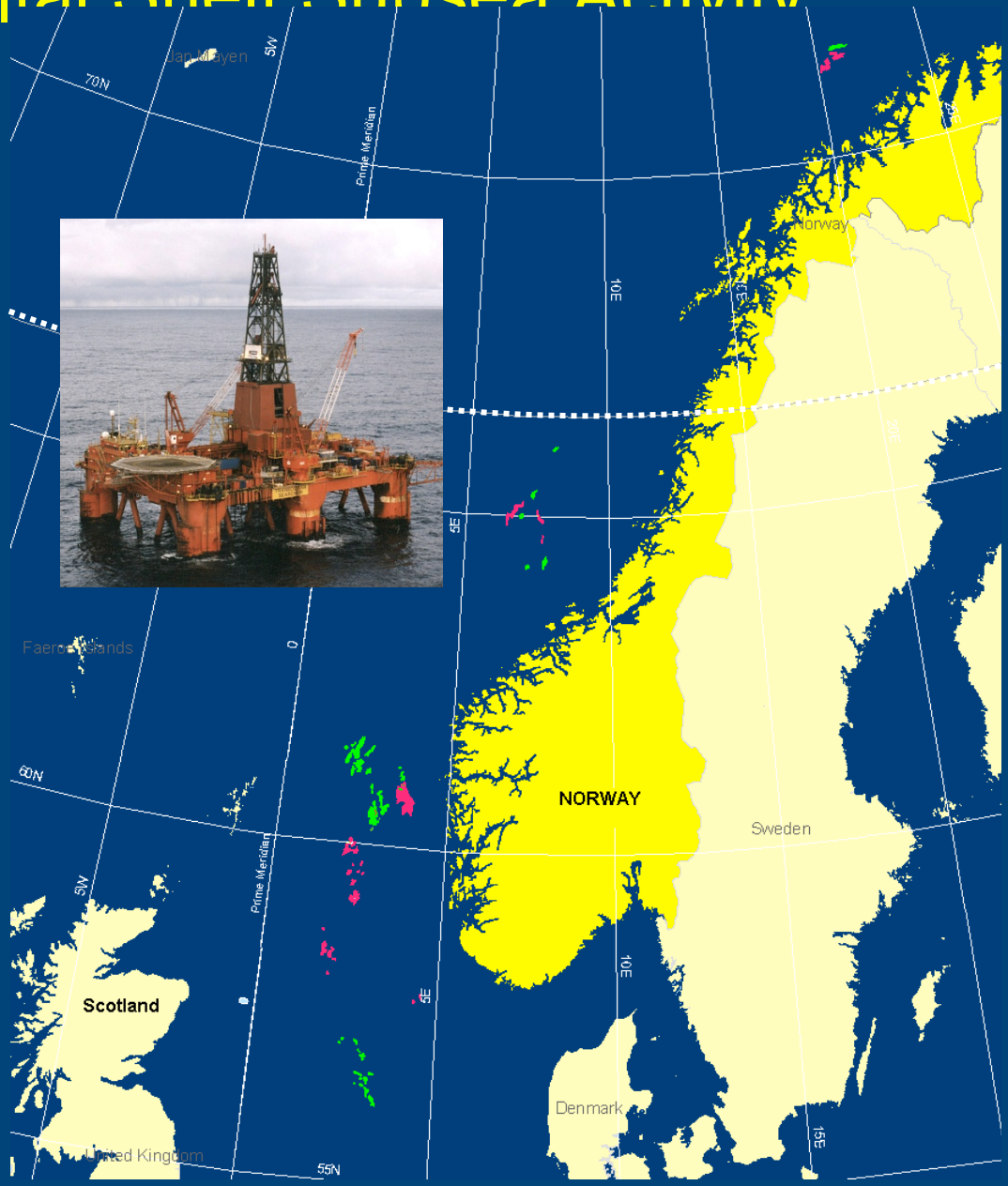
JMC Technology STATOIL Schlumberger

Agenda

- Norwegian Continental Shelf Activity
- Conventional Approach
- Issues and Strategies
- Equipment Developments
  - Advanced Tension Frame (ATF)
  - Riser Slip Joint
- Impact
- Conclusions

Norwegian Continental Shelf Subsea Activity

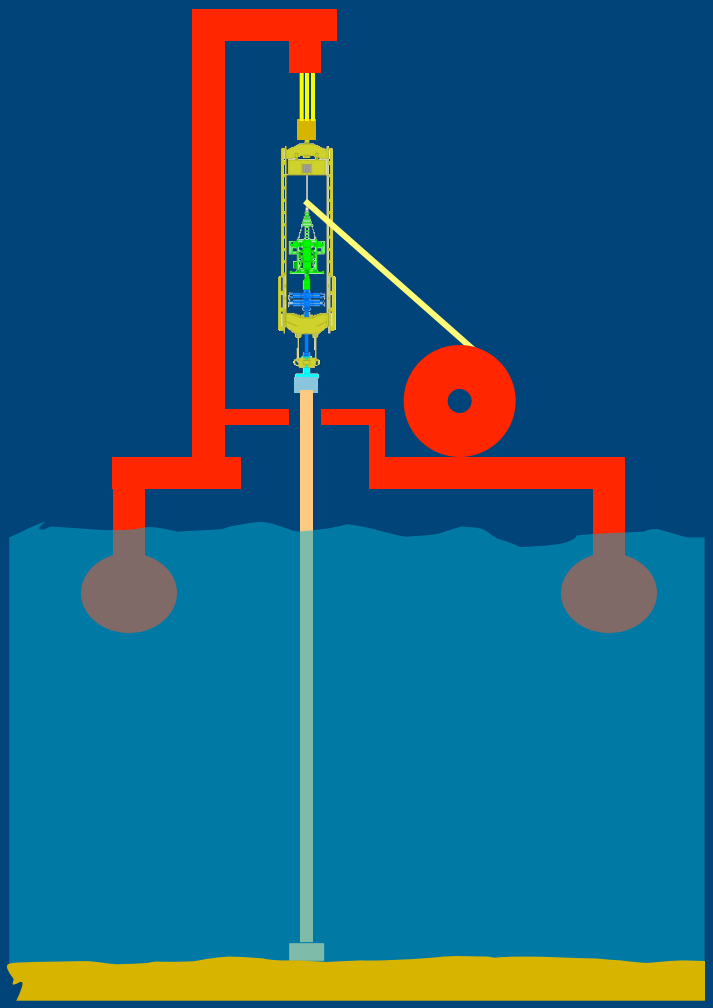
- 420 active wells
- Increasing 10% p.a.
- 60% Statoil production
- Severe weather and sea conditions
- Demand for intervention with CT increasing
- Available installations semi-sumbersible rigs



Conventional Scenario

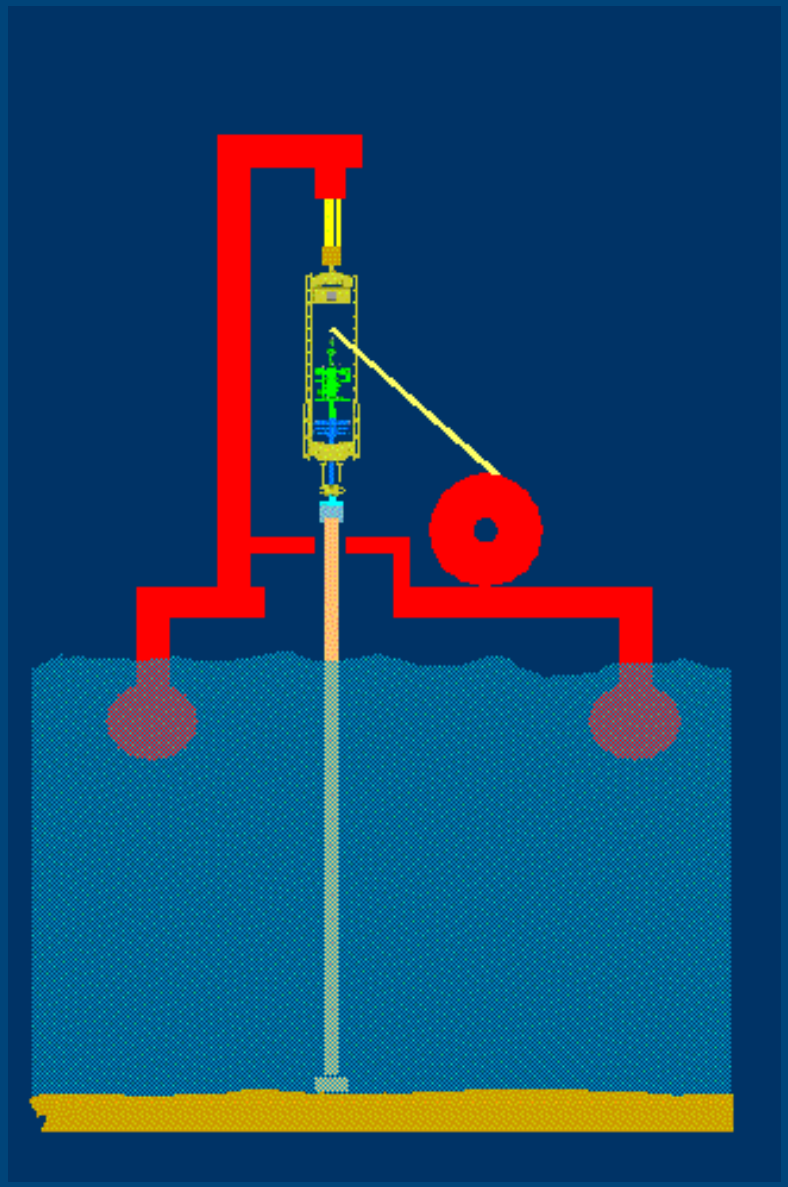
- Injector suspended from winch
- Multiple degrees of freedom of movement
- Influenced by heave, pitch, roll and reel tension

Conventional Scenario



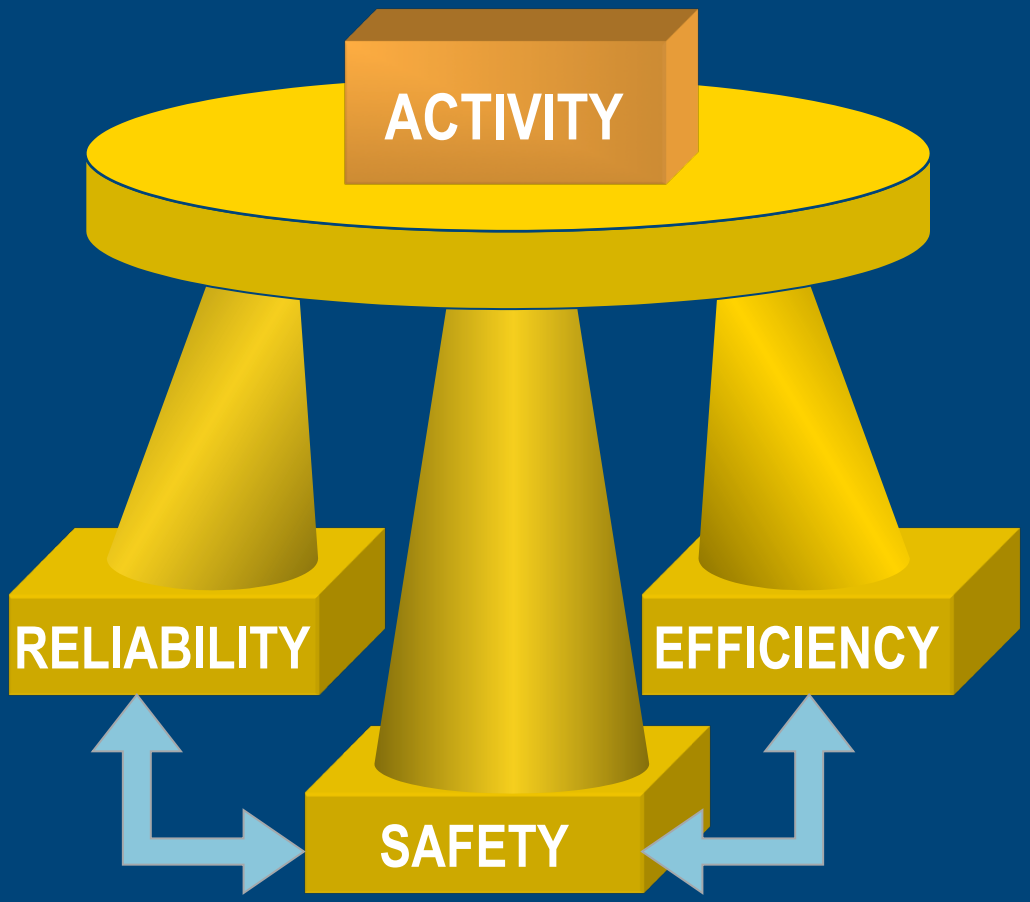
- Injector suspended from winch
- Multiple degrees of freedom of movement
- Influenced by heave, pitch, roll and reel tension
- Tension frame coupled to riser
- Multiple transfers between motion frame of reference

Conventional Scenario



- Injector suspended from winch
- Multiple degrees of freedom of movement
- Influenced by heave, pitch, roll and reel tension
- Tension frame coupled to riser
- Multiple transfers between motion frame of reference

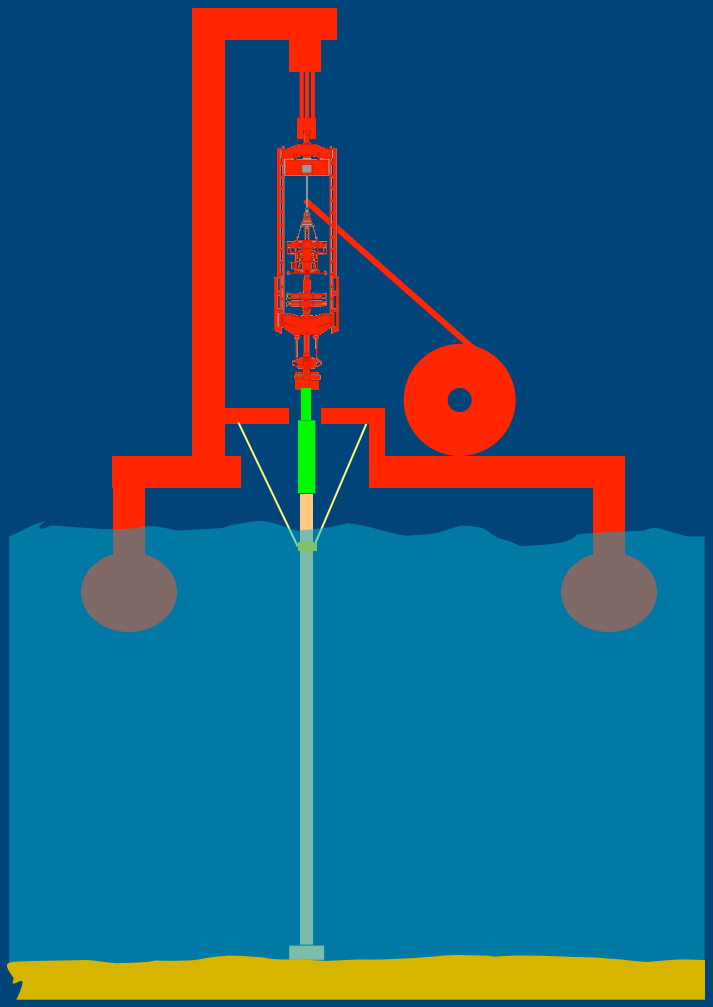
Issues and Strategies



Advanced Tension Frame

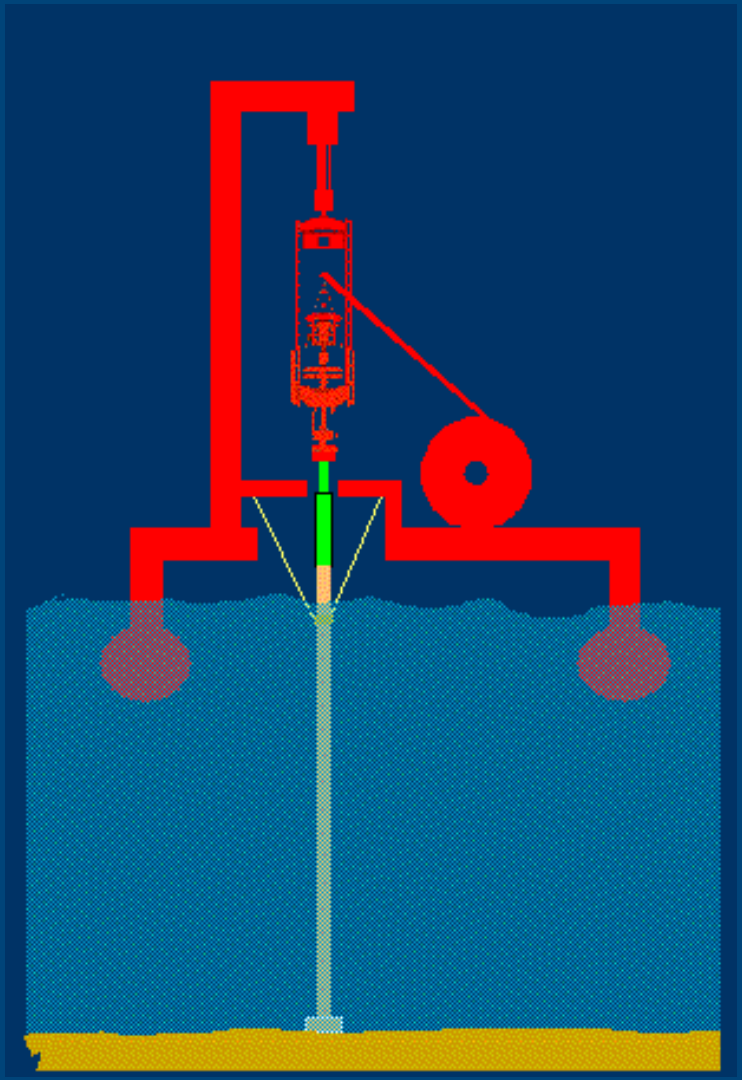
- Injector head is constrained at all times – motion is controlled

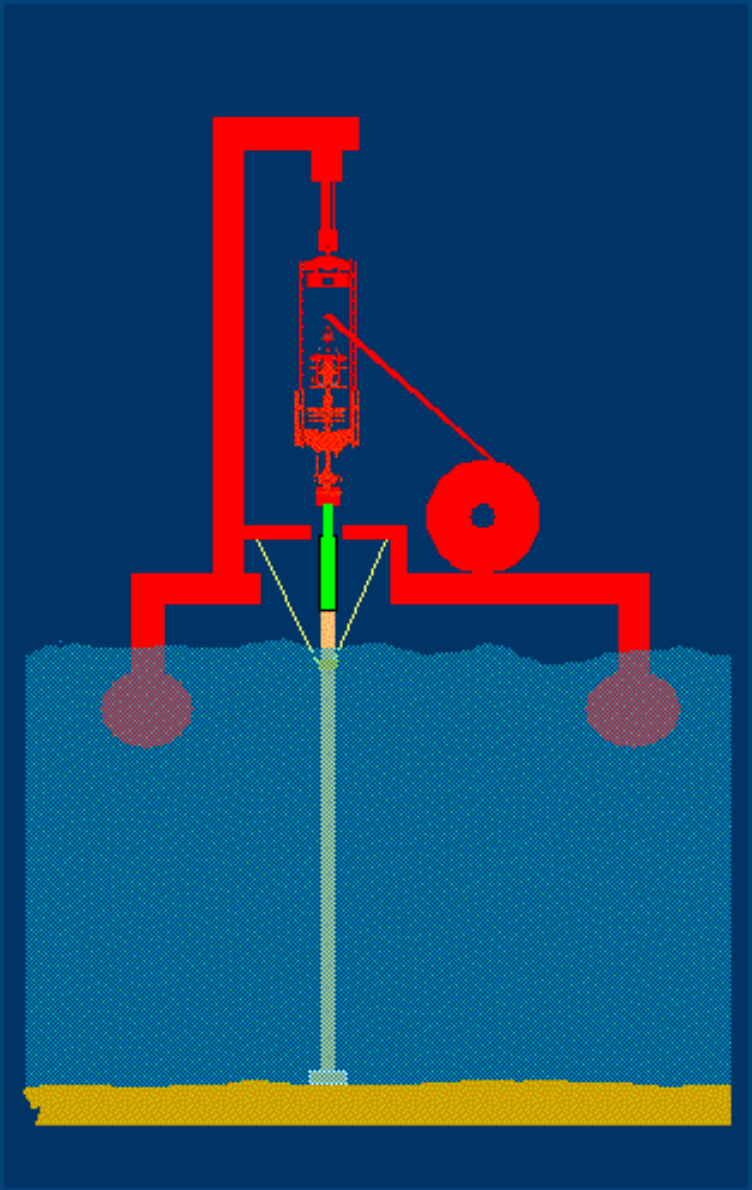
Slip joint



- Influence of heave isolated below rig floor

Slip joint

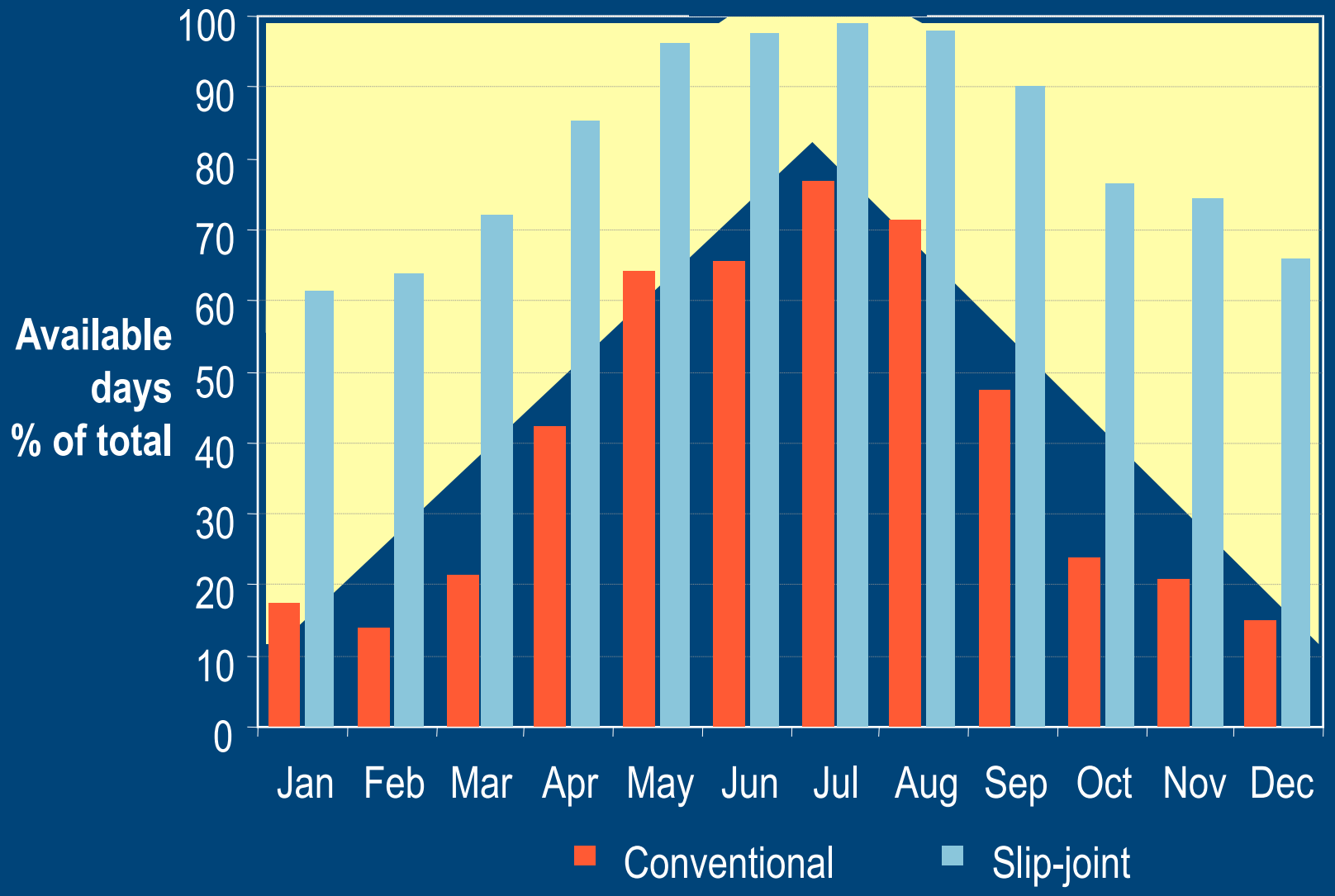


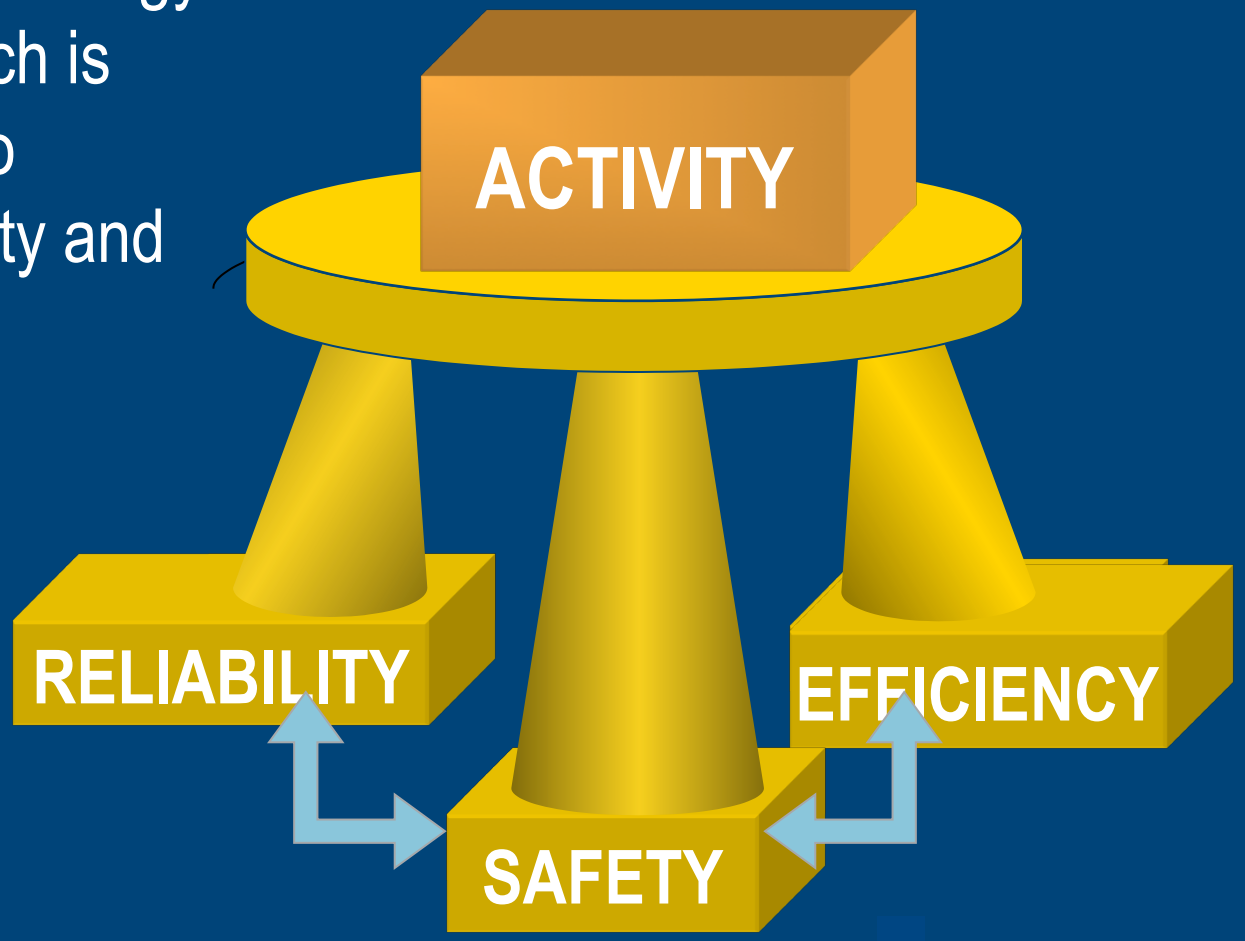


Impact 1 – Safety and Efficiency

Operation stage	Scenario			
	Conventional	ATF	Conventional +slip-joint	ATF + slip-joint
Transfer 2 crew up	6	6	2	2
Install BOP + BHA 1	30	30	12	0
Install injector	30	2	12	0
Transfer 2 crew down	6	6	2	2
Transfer 2 crew up	6	6	2	2
Change to BHA 2	30	2	12	0
Transfer 2 crew down	6	6	2	2
Transfer 2 crew up	6	6	2	2
Remove injector head	30	2	12	0
Remove BOP	30	30	12	0
Transfer 2 crew down	6	6	2	2
Total hazard level	**186**	**102**	**72**	**12**

Impact 2 – Reliability vs Weather



Conclusions

- Field tested technology is available which is demonstrated to improve reliability and safety