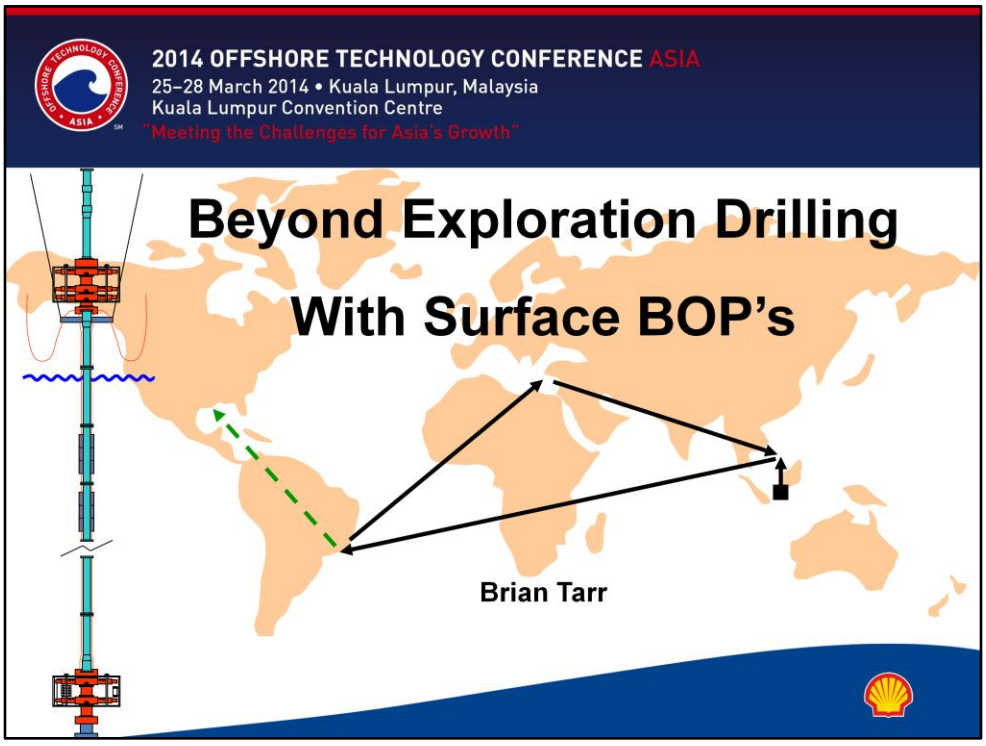
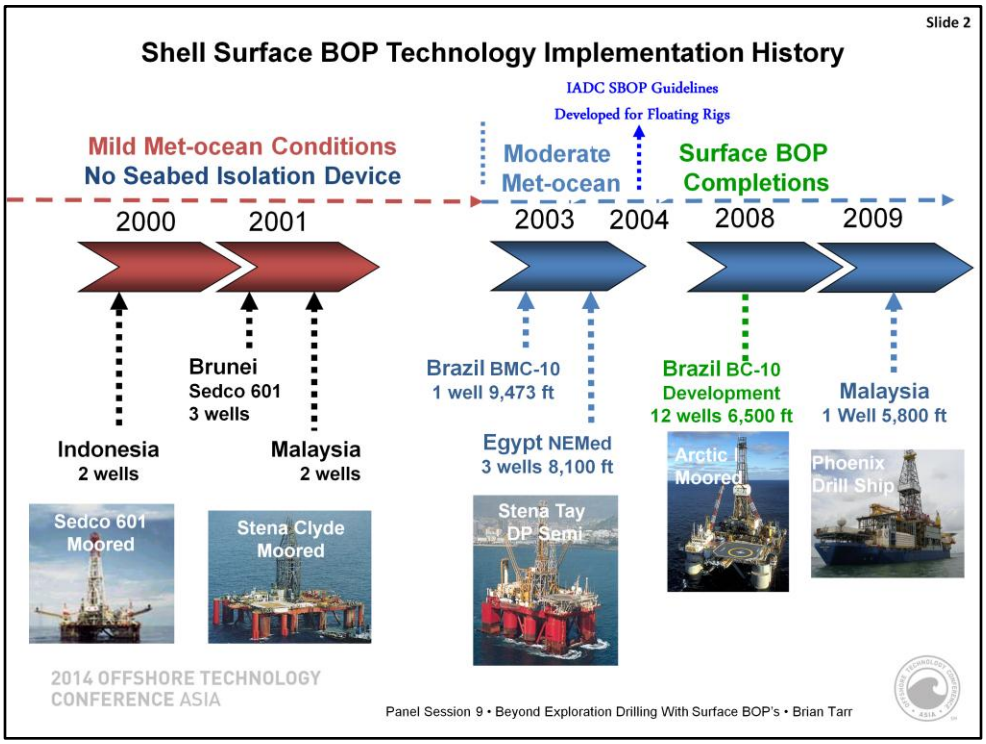


In this presentation I will be taking you on a very rewarding 10 year journey of innovation, discovery & successful surface BOP technology implementation.

As you take this journey with me, you will see that new capabilities were added with each new application that increased the reach of Surface BOP technology well beyond it's well publicized introduction for low cost Exploration Drilling in S.E. Asia.



For Shell the implementation journey started in 2000 when Unocal used a simple Surface BOP system to drill two low cost Exploration wells in Indonesia for Shell.

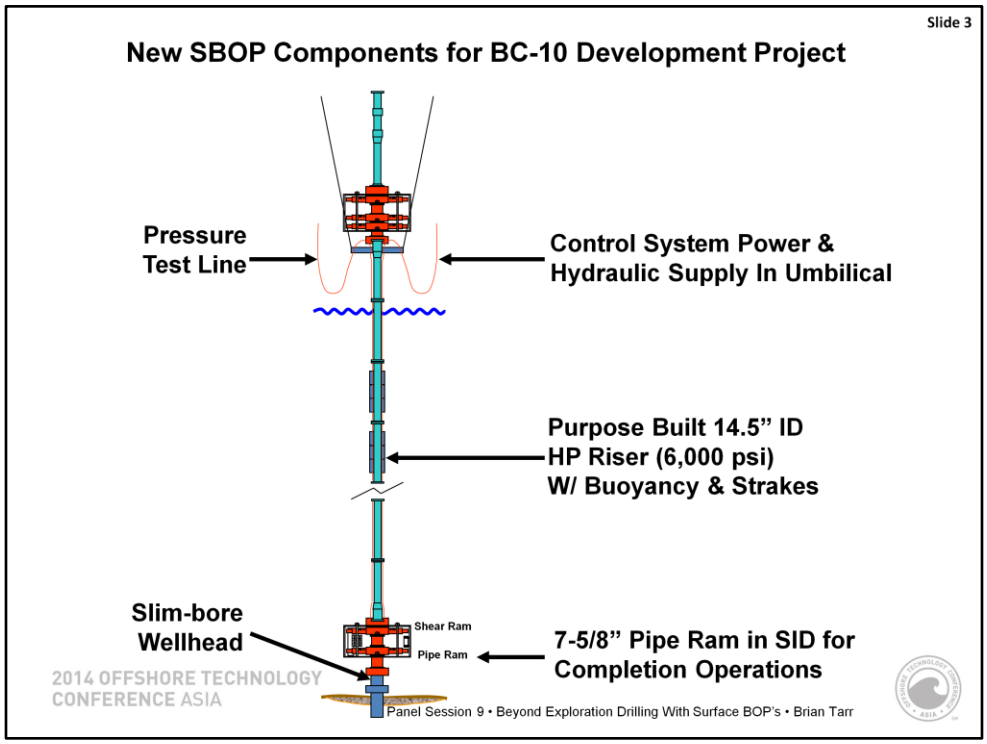
CLICK This was quickly followed in 2001 with two separate Shell operated Surface BOP campaigns in Brunei and Sarawak, using the Sedco 601 and then the Stena Clyde. Both rigs were moored rigs and no seabed isolation device was used.

CLICK In 2003 the real step change occurred with the introduction of the SID. It allowed Shell to use a 13-5/8" casing riser based Surface BOP configuration **for the first time** on a dynamically positioned rig operating in ultra deepwater, well beyond the rig's 7,500 ft water depth rating. **The Stena Tay drilled an exploration well offshore Brazil in a world record breaking 9,473 ft of water and then drilled 3 more wells offshore Egypt in approx. 8,100 ft of water.**

CLICK This experience provided the learning's needed for an industry panel of experts to develop the first SBOP guidelines manual for floating rigs that was published by the IADC in 2004.

CLICK The next step out was into Development **drilling and completion operations** with a Surface BOP equipped rig in 2008. The first subsea development project to use the technology was in block BC-10, a Shell operated development in 6,500 ft of water offshore Brazil. **This development went onstream in 2009 and the last of the 12 wells was completed in March 2010.** The Transocean Arctic 1, a modified 3rd generation moored rig was upgraded with Shell's SBOP system for this campaign.

CLICK Finally, in 2009 the first rig equipped with both a conventional Subsea BOP and a Surface BOP system went to work for Shell. The Frontier Phoenix drillship drilled an exploration well offshore Sarawak in 5,800 ft of water with it's Surface BOP system. This was **well beyond the rig's 4,500 ft WD rating** with it's conventional Subsea BOP system. At this point our SBOP journey had come full circle , i.e. back to S.E. Asia.



For development drilling and completions operations with the Arctic 1 several changes were made to the casing riser based Surface BOP exploration drilling system as shown in this slide.

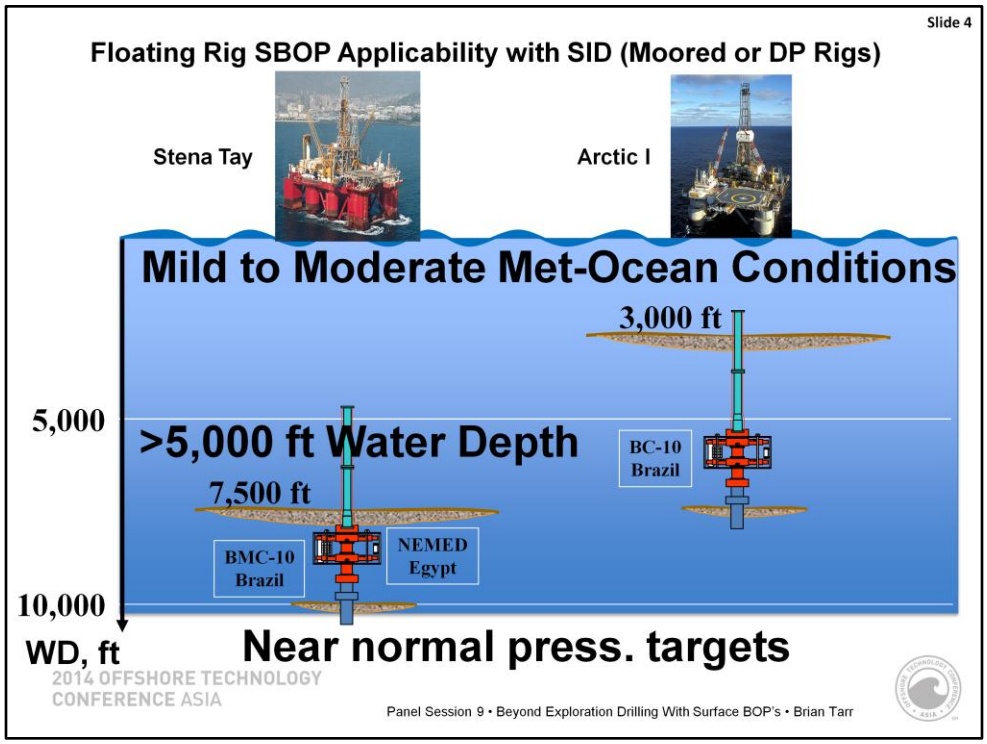
CLICK Starting from the wellhead, a **slim bore 18-3/4" system** was selected to permit running the 9-5/8" production casing as a full string instead of a liner.

CLICK The lower shearing blind ram in the SID was replaced with a **7-5/8" fixed ram** to permit tubing hanger pressure testing.

CLICK The 13-3/8" casing riser was replaced with a **purpose built 16" riser system** rated to max. 6,000 psi.

CLICK The **SID control system umbilical** was beefed up to include surface power and BOP fluid conduits to maximize the time the SID could remain subsea during batch drilling & completion operations.

CLICK Finally, a **high pressure hose** was added for tubing hanger pressure testing.



At this point you may be asking "What has Shell learned about screening for cost effective SBOP applications?"

CLICK 1st Near normal pressure subsurface targets - compatible with the 10,000 psi max. pressure rating of currently used SBOP floating drilling riser systems

CLICK 2nd Water depths >5,000 ft - as rigs that can be upgraded with a Surface BOP system are typically rated to at least 3,000 ft.

CLICK 3rd Outside severe metocean areas - like the Northern N.Sea and North Atlantic.

Let me illustrate

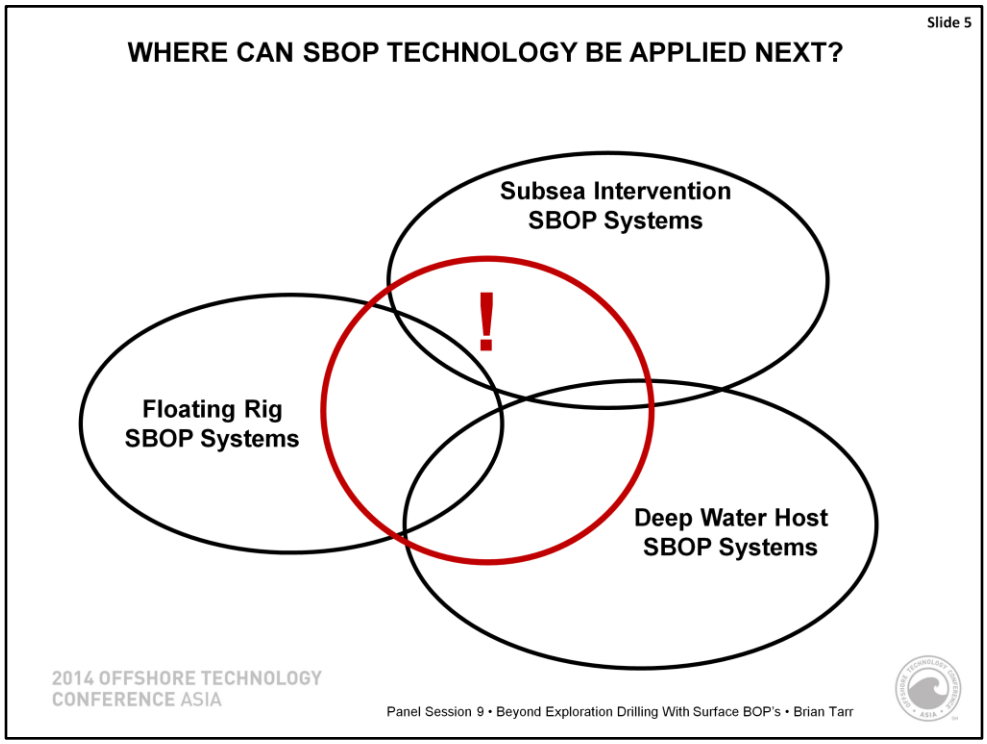
CLICK This chart shows how the Stena Tay water depth capability was extended from approx. 7,500 to 10,000 ft for exploration drilling.

CLICK and how the Arctic 1 water depth capability was extended from approx. 3,000 to 7,500 ft, in this case using a pre-laid mooring system in conjunction with the SBOP system previously described.

Hence, in a tight rig market, surface BOP technology offers the opportunity to both operators **and rig contractors** to cost effectively

a) extend the capability of a deepwater rig already under contract (like the Stena Tay) or

b) upgrade an available lower spec. rig to compete with other rig options for a new deepwater campaign (like the Arctic 1).



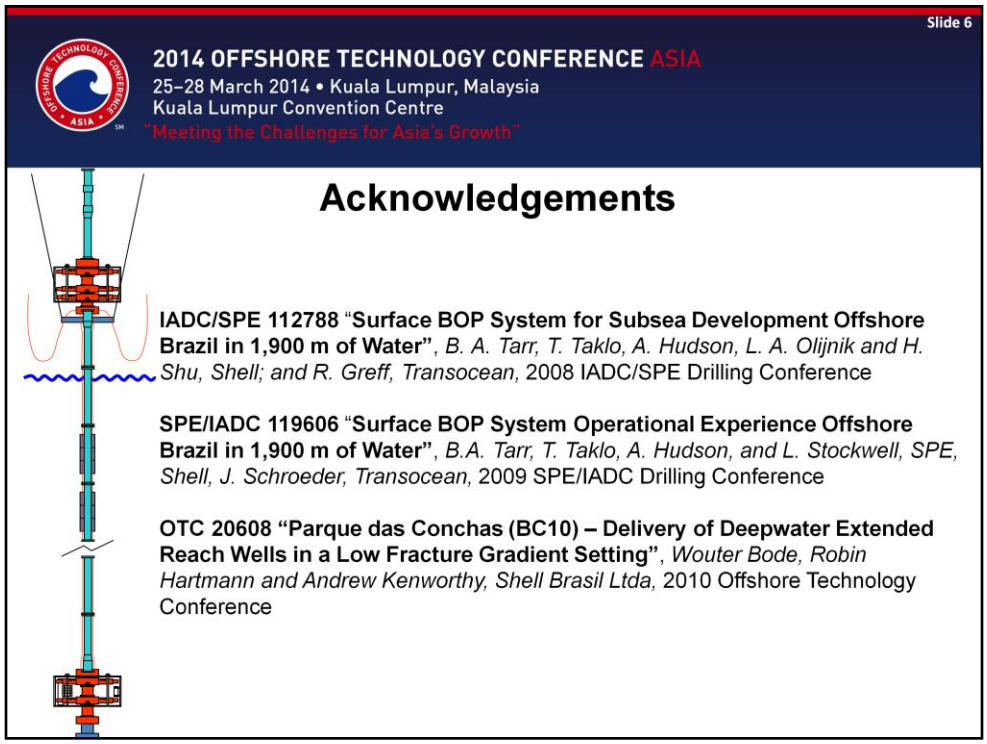
To answer the "What's Next?" question I'd like to introduce you to two other application arenas.

CLICK Surface BOP drilling systems have been the preferred choice on many **Deep Water Hosts**, including several in the Gulf of Mexico. **Host systems** have already benefited from Floating Rig system developments. For example, the Perdido SPAR, Shell's GoM ultra-deepwater host in approx. 8,100 ft, is using a Surface BOP system that employs some of the subsea completion system innovations pioneered on the Arctic 1 for the BC-10 subsea development in Brazil. By doing so, it became feasible to drill a larger number of wells from the Perdido SPAR vs. other similar SPAR's.

Note that the Surface BOP configuration on Olympus, Shell's latest GoM TLP in approx. 3,500 ft of water, complies with all the current barrier requirements for drilling and completing HPHT wells.

CLICK SBOP based **subsea intervention systems** have been in use for some time. Conventional subsea well intervention systems employ small diameter high pressure riser systems for wireline or coiled tubing work but a 16" casing riser based system has been built to do more extensive subsea well interventions.

CLICK Hence, I am personally confident that the Surface BOP technology journey will continue with both an expanding number of Surface BOP applications in all three of these current application arenas and innovative, **need driven, system configurations will evolve** from sharing experience and best practices across all three application arenas.



I would like to acknowledge all those who contributed to the SBOP technology journey and especially those identified in these three references related to the Arctic I development drilling campaign offshore Brazil.

In conclusion, Shell has the knowledge and experience to safely and cost effectively apply Surface BOP technology Globally in a wide variety of cost effective deepwater applications, including development drilling and completion operations.

AND my expectation is that the Surface BOP Journey will continue to be a rewarding one for those who find new, cost effective, ways to apply this deepwater technology.