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| **Issue** | **BSR-BSR-CSR** | **BSR-CSR-BSR** |
| Hung off with tubular that requires shear by CSR.  \* Will only be the case for our UD165 landing string. My understanding is that we can cut the 6 5/8” x 0.688” WT V150 and 6 5/8” x 0.522” WT S135 pipe with the TL BSR´s (?).  \* Above point is probably irrelevant as im guessing our standard EDS or shear ram sequence will always be to fire the CSR´s first in order to prevent potential blade damage on the sealing BSR´s prior to close them – i.e. always aim to have open wellbore for closing the BSR´s. | Both sets of BSR are available to seal well bore once pipe is cleared. (+)  \* In my opinion, the most likely scenario is that the pipe will move up due to tension. In the low chance case having to shear with not much length / weight below the stack, the driller should pick up.  \* I also think the most likely situation prior to an EDS or activation of any shear ram is to be hung-off. Only scenario where this would not be the case is a drive-off scenario (likely have time in a black-out / drift off) or catastrophic blowout that has reached surface without being detected. | Lower BSR is unable to operate unless the string is dropped first. (-)  \* Point only relevant with non-shearable pipe across the BOP stack. My understanding is that if hung off with shearable tubular, the BSR´s could still cut and seal below the CSR in an emergency situation (although this would leave a small fish in between the rams – is this a major concern in a real emergency situation?).  \* If we opt for BSR-CSR-BSR, then need to discuss ROV hot-stab function to allow opening of the HOR´s to drop the string. Will the rams open with rated weight hung-off? |
| AHD failure prevents tubular sheared by CSR to be moved upwards. | Un-shearable across both BSR. (-)  \* Only applicable for non-BSR shearable tubulars.  \* Lack of tension or AHD failure unlikely. | Lower BSR below CSR is available. (+)  \* Only if hung off with BSR shearable pipe across stack or not hung off and string has dropped. |
| Poor space out, tool joint across BSR | Highly likely this would impact both BSR. (-)  \* Agree – main positive for this option. 22 ½” between BSR cavities. Looking at between 29-35” length for pin and box tool joint combined length.  \* But most likely we will always use CSR EDS and string will pick up clear prior to closing BSR´s.  \* Have procedures in place to ensure drillers are always aware of space-out requirements.  \* Also chance we will be hung off – space out ok. | Lower BSR below CSR is available. (+)  \* Only applicable for BSR shearable tubulars. |
| Uncertainty after CSR shears as to how the tubular will respond, up or down. | If tubular does not move up and clear BSR, BSR cannot be closed. (-)  \* Most likely that string will move up due to tension. Driller can also pick up, or if in drive-off scenario, rig will drag pipe up.  \* Most likely to be hung off therefore string will not move down. | Up or down there is opportunity to seal well bore with a BSR. (+)  \* If hung off with non-shearable then string will need to be dropped (preferable to drop even with shearable tubular prior to closing BSR to avoid small fish scenario). |
| CSR shear takes place and tubular is picked clear of both BSR. | Redundant BSR to seal wellbore. (+)  \* Main positive for this option. Most likely scenario. | Only one BSR (upper) to seal well bore. (-)  \* Main negative for this option. Most likely scenario. |
| Well bore integrity is breached at CSR bonnet.  \* Very unlikely scenario. | No BSR to isolate well. (-) | One BSR below CSR to isolate well. (+) |
| Conversion of third cavity down to a pipe ram bonnet.  \* This is almost certain to never happen with a 7 ram stack. I would rather lose the test ram if I needed another set of pipe rams. | More difficult to achieve. (-) | Less difficult to achieve. (+) |
| Failure of Upper BSR. | Still leaves you a good configuration with BSR above CSR. (+)  \* Agree. Major point. | Leaves you a poor configuration with CSR above BSR. (-) |