completed.[7] Not until Transocean had its BOP ready could it have been deployed as part of a BOP-on-BOP solution. The scope of this work could not reasonably have been anticipated by BP or the Unified Area Command.

1.2 BOP-ON-BOP VENTING AND PRESSURE MANAGEMENT WAS NECESSARY TO MANAGE RISK

As part of the necessary and prudent work to identify and mitigate risks in developing capping solutions, the BOP-on-BOP solution called for the inclusion of a subsea choke connected to a vent manifold that would allow the venting of hydrocarbons.[8] The design, sourcing, installation, and testing of such a system is not an insignificant undertaking, and a Transocean engineer estimated on May 18 that a solution would take ten to fourteen days.[9] In my experience that is a reasonable, if optimistic, estimate. Inclusion of such a choke and a vent manifold was critical in two different respects.

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exert on the wellbore. The risk of exposing the Well to potentially unsafe pressures could not be ignored.

In contrast, a choke system allows what is called a "soft" shut in. Using a choke system, the well can be slowly shut in by incremental closure of the choke's orifice. This incremental approach allows an engineer controlling the process to ensure that pressures increase slowly while he monitors those pressure increases. This avoids the "water hammer" pressure surge. The shut in process can be stopped or reversed if the pressures approach an unsafe level. Providing an alternative flow path via the choke also protects the blind shear rams from potential erosion of sealing surfaces during closure. The capping stack that was ultimately used to shut in the Well did so over a period of approximately two hours by slowly closing its choke system while pressures were closely monitored.[10]

Second, in the event that the Well is shut in and ongoing monitoring indicates a need to reopen the Well, a choke system allows an engineer to reopen the choke

[7] Id.

[8] BP-HZN-2179MDL02405680.

[9] TRN-MDL-05012663.

[10] TREX 9577.