

Summary points from the Kill the Well on Paper Discussion
18 May, 2010

Present at the review:

Kate Baker
Bob Crane
Bill Kirton
Kurt Mix
Ole Kopp
Dan Wood
Jack Bullman (NASA)
Curt Amersman

John Benner
Jon Sprague
Charles Morrow
Scott Perfect
Jim Richmond
Mike Stone
Derek Wapman
Azun Mahmood (for part of the time)

Summary Points

- The need for accurate, low latency gauges and a system that permits rapid reaction of pumping operations to measured pressures was a point raised several times in discussion.
- Modeling indicates that a dynamic kill can be achieved for a well flowing oil at a rate of 5000 STBpd if the pressure in most of the flowing wellbore is above the bubble point
- Modeling indicates that a dynamic kill cannot be successfully executed if the oil flow rate is 15000 STBpd
- Knowledge of the flow rate is needed to form a view of the probability of success, as is knowledge of the position of flow restrictions.
- The dynamic kill operation is likely to put solids-laden fluid at a substantial rate through the BOP stack and riser, which may erode restrictions

fluid into the wellbore above some minimum rate. To achieve a static wellbore situation at the end of the pumping schedule, the mud weight pumped in is chosen to overbalance the flowing reservoir. If there will ultimately be a seawater gradient above a certain subsurface depth, this must be taken into consideration in the choice of mud weight. Also, the maximum pump pressure must be chosen so as not to compromise well integrity. For MG252 #1, the not-to-exceed pressure used in the calculations was 8,000 psi at the wellhead.

If the main chokes are deep in the wellbore, e.g. formation damage or 'skin' that reduces the effective permeability in the near-wellbore region, or partial cement across the flow path, then the

CONFIDENTIAL

AE-HZN-2179MDL00116750

AED001-116750

TREX 009245.0002