



## Summary of Mistakes and Omissions on Macondo Well

Gary L. Marsh

1. Running the production casing as tapered all-in-one rather than liner and tieback.
2. Failing to use best available and safest technology for light weight cementing slurry.
3. No consideration of bridge plug in 7" or squeeze of 7" x 9<sup>7</sup>/<sub>8</sub>" protective liner annulus to seal it locally in plan.
4. Running production casing that was pre-doped shoreside and probably no inspection of metal to metal seal surfaces on rig floor.
5. No circulating of bottoms up prior to cement placement.
6. Did not set lockdown on production-casing, seal assembly.
7. Pressure testing the production casing cement before cement had time to develop any strength.
8. Positive pressure tests on cement and casing too low.
9. Negative pressure test bleedback volumes and pressure implications misinterpreted or glossed over.
10. Circulated out riser with no pit level monitoring at any point.
11. Ignored pressure-volume-temperature (PVT) indications of excess flow while circulating out riser first hour and 10 minutes to 21:10 hours on April 20, 2010.
12. Bypassed PVT flow-out indicator after 21:10 by putting returns directly overboard.
13. Ignored drill pipe pressure with pump off at 21:20 and 21:30 with seawater most all the way around.
14. Not watching for riser flow with pump off at those times or not responding to an apparent flow.
15. Not closing blow out preventer (BOP) and diverter at 21:20 to monitor pressures and divert flow overboard.
16. Diverting riser outflow to (poorly designed and set up) mud/gas separator instead of directly overboard downwind when blow occurred.
17. Not pulling bop stack to fix dead and weak batteries in pods, non-functional (non-OEM) solenoid valve in yellow pod, and repair the leak in b/s ram t-lock.
18. Having 5000 psi rated annular bop element in 10,000 psi rated annular bop.