Well / Fluid Anomalies

- **Prevention**

1. MW In @ Active Pit

- The feedback needed by Mud Engr to achieve better accountability for mud program delivery
- Pumped-in (sampled) mud wrong representation (depends on sampling loc)

2. Pressured MW In @ Charge Pump

- True wellbore MW In without compressibility/circ gas errors up to 0.4 ppg
- Together with MW@Act, achieve most accurate and reliable info to control mud mixture MW

3. %Oil-H2O-Solids @Act @Centrifuge

- Consistent mud (primary barrier) constitution removes self-inflicted well anomalies
- Timelier control of LGS creeps (↓filter cake ↑drilleff)

Real time measurements - ingredient to Mud Management Automation

Well / Fluid Anomalies

- **Detection**
  1. **MW Out @Bell Nipple, @Shakers**
     - Adv warning for gas peaks and kicks
     - Hole Cleaning monitor via 'shifted' ΔMW
     - Flowback anomaly curve shape monitor
  2. **Volumetric Flow Out @BN, @Flowline**
     - Flow In gpm vs. Flow Out gpm (proper Δ)
     - Flowback signature differentiation allows earliest identification of anomalies

RT measurements - crucial ingredients to Well Control Automation

  3. **Return Flow% @Bell Nipple**
     - See previously invisible flowback signatures
     - Consistent flow level detection (6x more stable)