Wellbore Construction Integrity to Reservoir Production Longivity the Complete Vision: From Wellbore Stress Managemant to Reservoir Geomechanics

Perspective

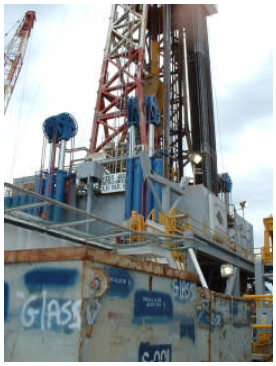
Wellbore integrity analysis is a logical extension of our geopressure analysis to complete the understanding of mud weight requirement beyond pore pressure control and assess wellbore trajectory risks. Accurately defined drilling window is the corner stone for setting casing and optimize drilling operation.

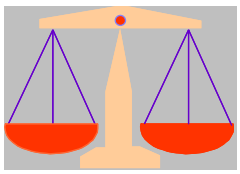
We work closely with our partners to make the best recommendation possible to drill the well based on mud type, additives, and mud weight requirements. Our services are focused on the following:

- *Integrate all well data to develop a robust rock mechanic model to predict wellbore failure under different operation conditions and predict the minimum mud weight required to stabilize the wellbore*
- *Study loss circulation problems and recommend solutions*
- *Study the effect of special mud additives to remedy loss of circulation*

DSI will evaluate all the dynamics of the wellbore pressure during drilling as well as the bounding constraints to insure all the pieces of the puzzle will fit! : Wellbore Stress Management

- ***Wellbore Stress Management: pre drill, real time, and post mortem***
- ***Salt creep and drilling best practices***
- ***Subsalt geomechanics***
- ***Laboratory testing program recommendations***
- ***In house Auditing***
- ***Assessment of loss circulation hazards***

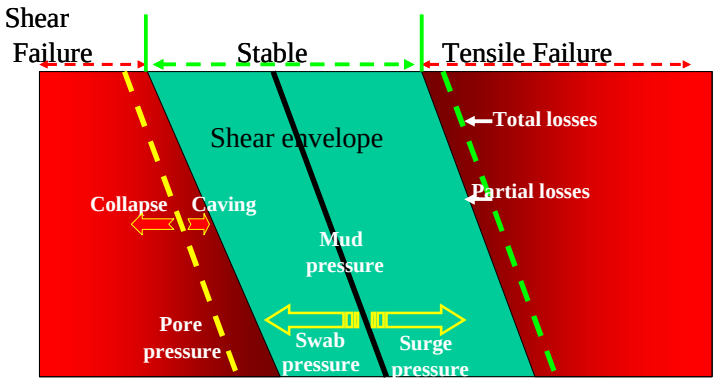




Wellbore Mechanics is a balancing act between rock strength and applied drilling induced stresses. We have to thread a needle in some cases to insure safe drilling process.

- *Study the feasibility of "stress cage" effects or benefits*
- *Interpretation of leak off tests and calibrate a fracture model*

We draw our unique strength from a pool of the world's top talents in the business of oilfield geomechanics. Therefore, your problems will get many second looks before we tender our proposal and recommendations.



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Keeping Your Drilling Window in check is your greatest challenge in any drilling project. DSI can deliver to your safety and get you the look ahead vision that you need to make your job easier. Complete definition of wellbore failure conditions and constraints in the pre planning and during drilling is our main focus

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Services

Well bore Stress Management

- **Research offset wells for indications of wellbore stability problems (from offsets and area geologic information)**
- **Identify stress regime, determine stresses magnitude in situ and direction from caliper data and breakout analysis.**
- **Use core test, logs, drilling data, etc to determine rock strength**
- **Design mud weight for maintaining wellbore stability**
- **Invoke field best practices for avoiding wellbore stability problems**

Wellbore stress management includes a host of technical evaluations: to name few:

- ***Pre existing fractures evaluation,***
- ***Addition of wellbore strengthening materials,***
- ***Exhaustive review of offset wells data to assess in situ stresses and rock strength.***

Pre Drill Wellbore Stability Prediction

You may have decided first hand on a well directional plan to probe/exploit geologic target(s). We take it from there. We offer simple yet effective analysis based on your initial directional plan,

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interval seismic velocity, and perhaps offset well data if available. The wellbore drilling window can be assessed, the effect of hole deviation on wellbore collapse is evaluated, and recommendations is developed for alternative well path if necessary. This analysis is crucial for your next step of comprehensive well planning of casing and mud program. Off course, DSI can carry the ball from here to a comprehensive well plan.

Recommendation for Laboratory Testing

It is vital that some level of core test is done to evaluate the effect of drilling fluid on rock strength with time. These simple tests (such as swelling test) will be used to screen fluid types or fluid formulations quickly. This vital geomechanics testing is typically overlooked for many reasons. DSI is a strong advocate of conducting simple and effective lab test designed specifically to fit your drilling project.

Subsalt "Gouge Zone" Geomechanics

This is one of the thorniest and costly problems in drilling the subsalt section. The gouge zone is typically sheared by salt movement (past or present) to a degree which render the rock extensively fractured. We can evaluate the degree of fracturing from our analysis of salt geometry and cuttings shape. Mud weight increase to combat this type of instability is not the answer. We can provide day to day analysis and advice on best practices for drilling operation and drilling fluid properties.

In House Auditing

Many operators do not have adequate in house resources to look after wellbore integrity prediction process. "Shooting from Heb" approach is a proven way to waste valuable rig time and money. DSI will work with you to insure conformance to state of the art geomechanics analysis and modeling. We have found from real life examples that this process is so vital, it means the success or demise of a company!

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