

STRESS FIELD DETERMINATION USING WELL DATA

1SILVA, A. T. and 2SANTOS, H. 1Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil; 2Petrobras/CENPES, Rio de Janeiro, Brasil.

The in-situ stress field has been recognized as a very important factor influencing some petroleum industry activities, both during drilling and production. Hydraulic fracturing jobs, wellbore instability, and sand production, for example, are highly influenced by the in-situ stress state and by the geometry of the well. A few methods have been used by the industry to define the stress regime in an area, such as breakout analysis, hydraulic fracturing and leak-off data. However, there are a number of well data available still not considered to improve the accuracy of the values. In order to take advantage of the whole well data set available, it has been proposed an integrated methodology that uses all available data, including both geologic (lithology and structures) and drilling information (ex.: leak-off test; breakouts; lost circulation, torque and drag, etc.). A wellbore stability simulator is used to calibrate the stress state from previous wells drilled, and the set of values (both direction and magnitude) are used to plan the future operations. As more wells are drilled, the new information is continuously feed into the system, to guarantee the improvement of the accuracy of the future results. This paper describes the methodology, with some field results showing the importance of having an integrated analysis to achieve a better determination for these critical parameters for drilling and production operations.