The computing of the casing scale model with using of ABAQUS system at tensile load

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The casing is under axial tensile loads during the life of the well because of the gravity force at lowering the casing. The critical section of the casing is situated on the wellhead and the tensile load arises because more joints are added to the string.

Briefly, the step sequence of the research may be described as follows. Firstly, the experiment was really performed. The 10 patterns of casing scale model were tested with the pull test machine UMM-20. Secondly, design model was realized with using of ABAQUS system. The design model consists of: the finite-element model, non-linear model of steel, the applied load (direction of the force and force value), type of the fixing. Finally, the combined tensile stress/strain diagrams were got and shown on figure 72. The tensile stress/strain diagrams overlaps each other (Young's modulus, hardening zones) total errors less 3%, therefore, behavior of design model correspond to behavior of real casing scale model. In general, the verified design model may be used for the computing of the real casing.

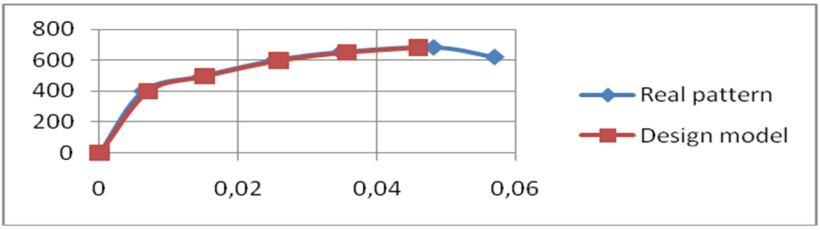

Figure 1 - combined tensile stress/strain diagram σ (ε)

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1. D.S. Simulia, 2013, ABAQUS PDF Documentation, Abaqus User's Manual Part I-VII, 1137 p.
2. Drilling Engineering Manual, Department of Petroleum Engineering, Heriot-Watt Universioty, 2013, 546 p.