

Performance demonstration of AUT Pipeline girth welds using simulation and the new CIVA AUT Oil and Gas software

STEPHANE LE BERRE¹, Laurent POMIE², Ludovic PINIER³, Guillemette RIBAY¹, Audrey GARDAHAUT¹

¹DISC, CEA, France, ¹Pipeline Production Group, TECHNIPFMC, France, ¹Onshore-Offshore Engineering Division, TECHNIPFMC, France

The full qualification and validation procedure for AUT Pipeline girth welds inspection requires a large number of experiments on representative welded mock-ups, with machined or seeded defects for the quantification of the AUT system, set up and procedures performances. The performances demonstration is expressed with the Probability of Detection and Sizing accuracy qualification as functions of the flaw height. To reduce experimental qualification and validation time and costs, the simulation is today considered and accepted in many industries (such as nuclear and aeronautics) as a promising and quantitative solution and a relevant aid for the constitution of the qualification and / or validation technical dossier. Numerical NDT demonstration of performance means multi-parameter sensitivity studies, taking into account the propagation of uncertainty and statistical analysis of the variability of the AUT essential variables. This communication will present the features of the new CIVA AUT Oil and Gas software developed by CEA, that will propose, for a given system, set up and procedure, a numerical quantification of the effects of the essential variables on the AUT performances (PoD and sizing accuracy) . CIVA Oil and Gas will propose a simplified graphic user interface and the automation of the simulation steps within a short computation time . The various qualification steps from calibration up to performances quantification will be presented with the final objective to reduce and to optimise the design of experiments on seeded defects coupons in order to reduce qualification and validation cost and schedule. The functionalities of the CIVA Oil and Gas software are under validation by a multi-sponsors project including oil and gas operators , pipelay installation contractors and AUT services vendors in order to match the software capabilities with the market expectations. Keywords : Simulation, Performance demonstration, Pipe, Oil and Gas, POD, Sizing, AUT, Girth Welds, Qualification, Validation