



# CEN ISO/TS 18166:2015 - NUMERICAL WELDING SIMULATION — EXECUTION AND DOCUMENTATION

M. RETHMEIER<sup>€</sup>, M. MOCHIZUKI<sup>¥</sup>, D. J. DEWEES<sup>\$</sup>, V. ROBIN<sup>‡</sup>, C. OHMS<sup>#</sup>, A.  
YOUTSOS<sup>ℒ</sup>, S. D. SMITH<sup>£</sup>, D. SCHWARK<sup>\*</sup>

*€BAM*

*¥Osaka University*

*\$The Babcock & Wilcox Company*

*‡Areva*

*#JRC Petten*

*ℒConsultant*

*£TWI Ltd*

*\*DIN*

## ABSTRACT

Engineering methods have been developed to provide a means of establishing the Fitness-For-Service (FFS) of safety and environmentally critical facilities. Typically this involves a proof that structures have been made with good workmanship and, in addition to this, that structures are defect tolerant. Many parts are fabricated by means of welding. Welds are loaded by the combination of the service generated operational loads and the locked in residual stresses from fabrication. Computer based methods for the prediction of welding residual stresses have been developed since the 1970s, but there has been an acceleration of reliability and interest recently. It is therefore timely to prepare a global overview of good practice based on the experiences of engineers from many countries so that residual stress prediction becomes a reliable engineering activity for the review of the safety of welded fabrications.

In 2012, ISO/TC 44 (Welding and Allied Processes Technical Committee [TC]) proposed a New Work Proposal Item (NP) on welding simulation. (An NP contains the consensus of national experts and is the first activity in the process of preparing a standard, or, if this is not possible, a Technical Specification (TS).) A Working Group (ISO/TC 44/WG5 Welding Simulation) has prepared ISO/NP 18166 ('Numerical Simulation - Execution and Documentation', WG5 document N0062). The current paper summarises the content and scope, and provides justification for the style of the document which is relatively limited when compared to the considerable range of methods, materials and welding processes that could have been explicitly covered. The draft is now available for public comment through national standards organisations.