

INTERPRETATION

**Requirements for the Integrity Management of Grade 91 Steel
Used Above Currently-Permitted Allowable Stresses**

As provided for under sections 37, 40, 41 and 42 of the *Pressure Equipment Safety Regulation*, this Information Bulletin establishes that ABSA document AB-536 *Requirements for the Integrity Management of Grade 91 Steel Used Above Currently-Permitted Allowable Stresses*, Edition 1, Revision 0, specifies requirements that must be met for the continued use of pressure equipment components that are made of Grade 91 steel at stress values that exceed the stress values currently allowed by the construction codes.

AB-536 provides guidance on meeting requirements and duties specified in the *Pressure Equipment Safety Regulation* sections:

- 37(c) with respect to establishing safe operating limits,
- 40 with respect to repairs and alterations,
- 41 with respect to integrity assessment programs, and
- 42 with respect to integrity assessment.

The requirements of AB-536 are to be implemented by owners of affected equipment prior to August 1, 2020, as described in AB-536.

BACKGROUND

A creep-strength-enhanced ferritic steel designated as Grade 91 was introduced in the early 1980s to provide significantly better strength properties at high service temperatures than other materials that were available at the time. In the years since its introduction, it has been determined that its superior strength characteristics are more dependent on careful control of material chemistry and fabrication processes than originally understood. This has led to a reduction in the allowable stresses for use of these steels at high temperatures permitted by the newly-published 2019 Edition of Section II-D of the ASME Boiler and Pressure Vessel Code.

Although new equipment that is within the scope of an adopted code must be constructed to that code’s current requirements, including use of the lower allowable stress levels, concerns were raised as to how to safely justify continued use of existing equipment which relies on the higher allowable stress levels that were previously permitted.

In January of 2018, an industry task group was formed to address this question, and after bimonthly meetings, their recommendations were made to ABSA in a formal report that was issued in February 2019 and endorsed by the Pressure Equipment Sub-Council of the Safety Codes Council at their meeting in March. The AB-536 document referred to above is based on the recommendations made by the industry task group, and is thus the result of the

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collaborative effort of industry and ABSA working together to determine a reasonable standard of care for equipment owners faced with the task of continuing to safely use and maintain equipment which makes use of Grade 91 steel at high service temperatures.

AB-536 establishes that engineering assessments are to be performed to establish the safe operating limits of components made of Grade 91 steel when these components will be subject to stresses greater than those permitted in the current code editions. AB-536 also specifies technical and administrative requirements for repairs, alterations, and fitness-for-service assessments of Grade 91 components.

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