

## **A Comparative Study of Various Concrete Strength Theories on the Structural Performance of PCPV**

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### SUMMARY

Eight well known concrete strength theories, given in Table I, are simulated in the three-dimensional finite element analysis of prestressed concrete reactor pressure vessels. An existing vessel is examined for both elastic and inelastic conditions. Stress contours and crack patterns are obtained for operational and overload conditions. In certain critical areas of the vessels variations do exist. Some theories show a great divergence in results, especially in the top cap. These have a minor influence on the operational conditions but have a great influence on the final load-carrying capacity of the vessel. Conclusions are drawn on the merit and demerit of a specific theory in relation to the performance of the vessel.