Luis A. Godoy

Born in Argentina, 1950.

Graduated as Civil Engineer, National University of Cordoba, Argentina Major: Civil Engineering 1969-1975.

Ph. D. University College, University of London, England. Major: Civil Engineering 1975-1979. Thesis: Stresses in shells of revolution with geometrical imperfections and cracks, Thesis advisor: James G. A. Croll & Kenneth O. Kemp.

During a 35 year career, Godoy has been permanent or visiting faculty at the National University of Cordoba, University College London, Universidad Politecnica de Catalonia, West Virginia University, University of Puerto Rico, and Universidad Carlos III de Madrid.

Current position

Professor, Structures Department, FCEFyN, National University of Cordoba, and Science Research Council (CONICET), Argentina

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Shell buckling research

During the last 15 years, we have oriented our research to understand the buckling of shells employed in aboveground oil storage metal tanks. Such tanks are thin-walled cylindrical shells with or without a roof, for which the most severe design constraints are associated with wind and earthquake loads. Emphasis has been given to buckling of the tank, which takes the form of localized buckling in the windward region (under hurricane effects) and elephant foot buckling (under seismic loads). The research includes wind tunnel studies to evaluate the pressures on the shell and the roof, and Computational Fluid Dynamics simulations to evaluate pressures under special conditions, such as topographic effects and dikes. Sloshing has been taken into account for seismic response of tanks. Support settlements of a tank and fire effects have also been investigated.

Nonlinear analysis has been used to obtain equilibrium paths and imperfection-sensitivity; whereas a non-classical lower-bound reduced energy approach have been followed to estimate safe buckling loads. Most computational models use a general purpose finite element package or special purpose software developed in-house.

Industrial buildings have also been investigated under high winds. The aim is to produce fragility curves for this class of buildings in which several components are taken into account and specific curves are developed for each. Recent work on practical application includes the plastic buckling of metal folded plates under impact of flying objects, such as those carried by wind. The failure of canopies in gas stations under hurricanes is investigated using wind tunnel, Computational Fluid Dynamics and structural analysis.

Books

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