



Postbuckling Analysis of Stiffened Cylindrical Shells under Combined External Pressure and Axial Compression

Hui-shen Shen,^a Pin Zhou^b & Tie-yun Chen^b

^aDepartment of Civil Engineering, ^bDepartment of Naval Architects and Ocean Engineering, Shanghai Jiao Tong University, Shanghai 200030, People's Republic of China

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ABSTRACT

A new approach is extended to investigate the buckling and postbuckling behaviour of perfect and imperfect, stringer and ring stiffened cylindrical shells of finite length subject to combined loading of external pressure and axial compression. The formulations are based on a boundary layer theory which includes the edge effect in the postbuckling analysis of a thin shell. The analysis uses a singular perturbation technique to determine the buckling loads and the postbuckling equilibrium paths. Some interaction curves for perfect and imperfect stiffened cylindrical shells are given and compared well with experimental data. The effects of initial imperfection on the interactive buckling load and postbuckling behaviour of stiffened cylindrical shells have also been discussed.

NOTATION

A_1, A_2	Cross-sectional area of stringer and ring stiffener
b_1, b_2	Load-proportional parameter
d_1, d_2	Distance between centers of stringers and rings
E_1, E_2, E	Elastic modulus of stringer, ring and skin
e_1, e_2	Stringer and ring stiffener eccentricity
\bar{F}, F	Dimensional and nondimensional form of stress function