Three-dimensional steep wave impact on a vertical plate with an open rectangular section

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Highlights

- The three-dimensional hydrodynamic slamming problem on a vertical plate subjected to the impact of a steep wave using linear potential theory is considered.
- The problem is complicated by assuming a rectangular opening on the plate.
- The examined configuration determines two boundary value problems with mixed conditions.
- The mathematical process assimilates the plate with a degenerate elliptical cylinder allowing the employment of elliptical harmonics.
- The mixed boundary value problems are tackled using robust mathematical analysis.
- The theory is extended to the computation of the total impulse exerted on the plate using pressure-impulse theory.