In this study, the buckling problem of functionally graded materials (FGMs) sandwich truncated conical shells (STCSs) under hydrostatic pressure was solved using the modified form of first-order shear deformation theory (FOSDT). The FGM properties of the constituents are graded in the thickness direction in accordance with a power-law distribution. The basis equations of FGM sandwich truncated conical shells (FGMSTCSs) are derived from the Donnell kinematics assumptions. Using the Galerkin method to the partial differential governing equations, the formula for the dimensionless hydrostatic buckling pressure (DHBP) in the framework of the FOSDT is obtained to demonstrate the buckling response of FGMSTCSs. A numerical analysis is performed for various types and geometry of FGMSTCSs under FOSDT and the classical shell theory (CST).