## Man-made Extreme Hazard Effects on Bridges

Anil K. Agrawal, Ph.D., P.E., Dist. M. (ASCE)

The City College of New York, USA

## Abstract

Highway bridges are frequently vulnerable to collapse because of man-made extreme hazards, such as blast, vehicular impacts, vessel impacts, large ship impacts, etc. There are numerous examples of collapse of highway bridges because of these extreme hazards. The presenter has investigated these hazards and their effects on bridges extensively over last 15-20 years. This presentation will highlight modeling of these hazards, their effects on safety of bridges and countermeasures to improve safety of highway bridges, particularly long-span bridges.