A MITIGATION PROGRAM FOR POTENTIALLY HAZARDOUS LONG-PERIOD COMETS

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A program is being developed to avert collisions of potentially hazardous objects (PHOs) with Earth by Southwest Research Institute and Los Alamos National Laboratory. In addition to developing the general mitigation strategies, the program will be expanded to include aggressive mitigation procedures for small (e.g., Tunguska-sized) potentially hazardous objects (PHO) and other short warning-time PHOs, such as some long-period comet nuclei. The program will initially concentrate on the most likely and critical cases, namely small objects and long-period comet nuclei with short warning-times. In this paper we discuss the threat posed by long-period comets. Although relatively rare but large (sometimes tens of kilometers in size) and fast moving, their detection cannot be predicted because of their long orbital periods, for example, comet C/1983 H1 (IRAS-Araki-Alcock) has an orbital period of 963.22 years. It was discovered on 27 April 1983, and passed Earth at a distance of 0.0312 AU on 11 May 1983, only two weeks later. Aggressive methods and continuous alertness will be needed to defend against objects with such short warning times. We summarize results on anticipated warning times of long-period comets given advances in modern telescopic facilities searching for such objects to present nominal and worst-case scenarios for these potentially hazardous objects.