Paper ID: 41685
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SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES (D6)
Commercial Space Flight Safety and Emerging Issues (1)

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# COMPARATIVE STUDY ON SIMULATION OF EXPLOSION OVERPRESSURE BY LAUNCH PAD ACCIDENT

**Abstract**

In this study, we study about explosion overpressure on launch pad of explosion accident. During the design or construction phase, the safety analysis is mandatory to arrange the Launch pad building. If the launch pad equipment or launch vehicle explodes in an unexpected accident, the explosion overpressure may cause damage to the ground equipment and personal injury. In the case of launch pad ground equipment, it is composed of the most essential facilities and equipment for launch vehicle. However, if the launch vehicle is in an abnormal situation, the Launch pad must be exposed to the most risk and must be secured safety against abnormal situations and accidents. In this study, we assume the worst scenario of launch pad accident, and calculate the explosion overpressure based on worst scenario of launch pad accident. The conventional methods are 2d based simulations which BST methods, TNO multi-energy methods and TNT equivalence method. The proposed safety region calculation through the explosion overpressure analysis by the conventional methods does not include the buildings and the surrounding shapes around the launch pad, explosion position and congestion level of launch pad. So the accuracy of the result is quite low because the propagation shape of the explosion wave cannot be considered. In this study, 3D simulation is applied for calculation of explosion overpressure. It is possible to present a more precise explosion safety region and evaluate the safety of the launch pad when analyzing the explosion shape through the analysis of the three-dimensional computational fluid dynamics simulating explosion overpressure by the geographical features of the surrounding launch pad and the construction shape of launch pad. It is expected that it will contribute to the safety improvement of the launch pad through analysis of various explosion scenarios, and using this studying results can be used for fire analysis and explosion risk analysis