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Explosive Train Scale Safety Testing of Candidate Booster Materials ANDREW STOODLEY, MARK WRIGHT, GARETH FLEGG, TRACEY VINE, AWE PLC, ALDERMASTON, READING, BERKSHIRE COLLABORATION, QINETIQ, FORT HALSTEAD, SEVENOAKS, KENT COLLABORATION — A concern for initiation train design is that the use of relatively sensitive explosives to initiate an IHE could degrade its inherent safety properties. In order to understand the effect of a more sensitive explosive on an IHE, it is important to characterise the candidate explosive train materials as they would be utilised. To support the safety assessment of candidate booster explosives, a collaboration was established to evaluate the response of various formulations of interest (UF-TATB, LLM- 105, FOX-7, HMX and TATB) in the Explosive Train Scale Safety tests developed by QinetiQ. This report describes the three experimental configurations (slow and fast cook-off and shock sensitivity) and the results for the aforementioned materials. All of the materials displayed good safety characteristics in the fast cook-off, resulting in low order deflagrations. The TATB based, LLM-105 and most of the HMX based materials also displayed a similar response in the slow cook-off tests, yielding a low order event. The shock sensitivity experiments ranked the materials in the expected order, with UF-TATB yielding the least sensitive result recorded in the XTSS tests to date.

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