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Modeling Interface defeat and Dwell in Long Rod Penetration into Ceramic Targets YEHUDA PARTOM, RAFAEL — When a long rod projectile hits a ceramic target, the projectile may sometimes dwell at the target boundary and flow radially. This dwell or interface defeat phenomenon has to do with the dynamic failure process of the ceramic target material. As ceramics are brittle materials, what is probably missing, is a realistic model for dynamic failure of brittle materials. A "standard" model like this is the so called JH model (which has several versions). According to JH the material fails as a function of the effective plastic strain, which is a ductile response feature. Brittle materials are not supposed to accumulate plastic strain before they're fully failed. To model dwell we propose here a different failure model. We call it BSFM (= Brittle Shear Failure Model), and it is based on the Overstress (or overload) principle. Our BSFM is rather simple, has a small number of adjustable parameters, and is readily calibrated. We implement the model into a hydro-code, and demonstrate how it works for a typical example of dwell situation. We then calibrate the model parameters to reproduce data obtained recently at SwRI in San Antonio Texas.

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