Ballistic Limit Calculations of Spent Fuel Pool Panels Using the SAMPLL Code (U)
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Vincent K. Luk

(OUO) In the NRC Integrated Vulnerability Assessment Project, the SAMPLL code was used to calculate the ballistic limits of reinforced concrete panels as an indicator of their perforation resistance against impactors. These calculations were performed during November and December, 2001. The ballistic limit is defined as the threshold impact speed resulting in a zero exit speed after perforating the target. In the ballistic limit calculations, the rotor was used in modeling the aircraft engine as a flat-ended cylinder. For turbine engines, the rotor mass was estimated at 80% of the engine mass.

Ex. 1

(U) The SAMPLL (Simplified Analytical Model of Penetration with Lateral Loading)[i] code was developed at Sandia to realistically and economically predicts penetrator/target interaction. It uses empirically based algorithms, formulated from an extensive experimental database of various types of penetrators propelled at various concrete panels, to replicate the loads on the penetrator during the penetration event. The SAMPLL code can calculate the penetration/perforation[1] performance of penetrators against geological and concrete targets, but it cannot calculate the hole size.

(U) SAMPLL uses empirically based algorithms, which are formulated from an extensive penetration database compiled at Sandia over a period of 25 years[ii]. The code is well validated for the range of weapons applications provided by the existing database that covers deep penetration into geological and concrete targets, and angles of impact and attack less than 15°.

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Classified by:	Robert D. Waters, Mgr.
Title:	Manager, Vulnerability & Risk Analysis Dept. (06414)
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Portions Ex. 1