

date: October 9, 2013

to: Terry Hinnerichs, 1524

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subject: Regarding difference in stiffness between poled and unpoled PZT

1 Introduction

A simplified simulation for the B61 fuze stack, depicted in Figure 3 was performed to determine the difference in stiffness between the unpoled PZT insulator and the poled PZT active fuze element. The boundary conditions for the simulation matched those of the X18 experiment of the impact fuze assembly performed by Jerry Capp in November 2001 and consisted of stress free boundaries on the fuze's edges with an applied velocity on the fuze base. A 1000 ohm resistor was modeled between the electrodes at each end of the active fuze element.

2 Results

The difference in the average bulk modulus response is bout 1.35%.

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Figure 1. Fuze stack mesh

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Figure 2. Comparison of bulk modulus for poled and unpoled materials

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Figure 3. Average bulk modulus for poled and unpoled materials