Review of Test Data Indicates Conservatism for Tile Penetration

• The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 Southwest Research data
  – Crater overpredicted penetration of tile coating significantly
• Initial penetration to described by normal velocity
  – Varies with volume/mass of projectile (e.g., 200 ft/sec for 3 cu. In)
• Significant energy is required for the softer SOFI particle to penetrate the relatively hard tile coating
  – Test results do show that it is possible at sufficient mass and velocity
• Conversely, once tile is penetrated SOFI can cause significant damage
  – Minor variations in total energy (above penetration level) can cause significant tile damage
  – Flight Condition is significantly outside of test database
    • Volume of ramp is 1920 cu in vs 3 cu in for test