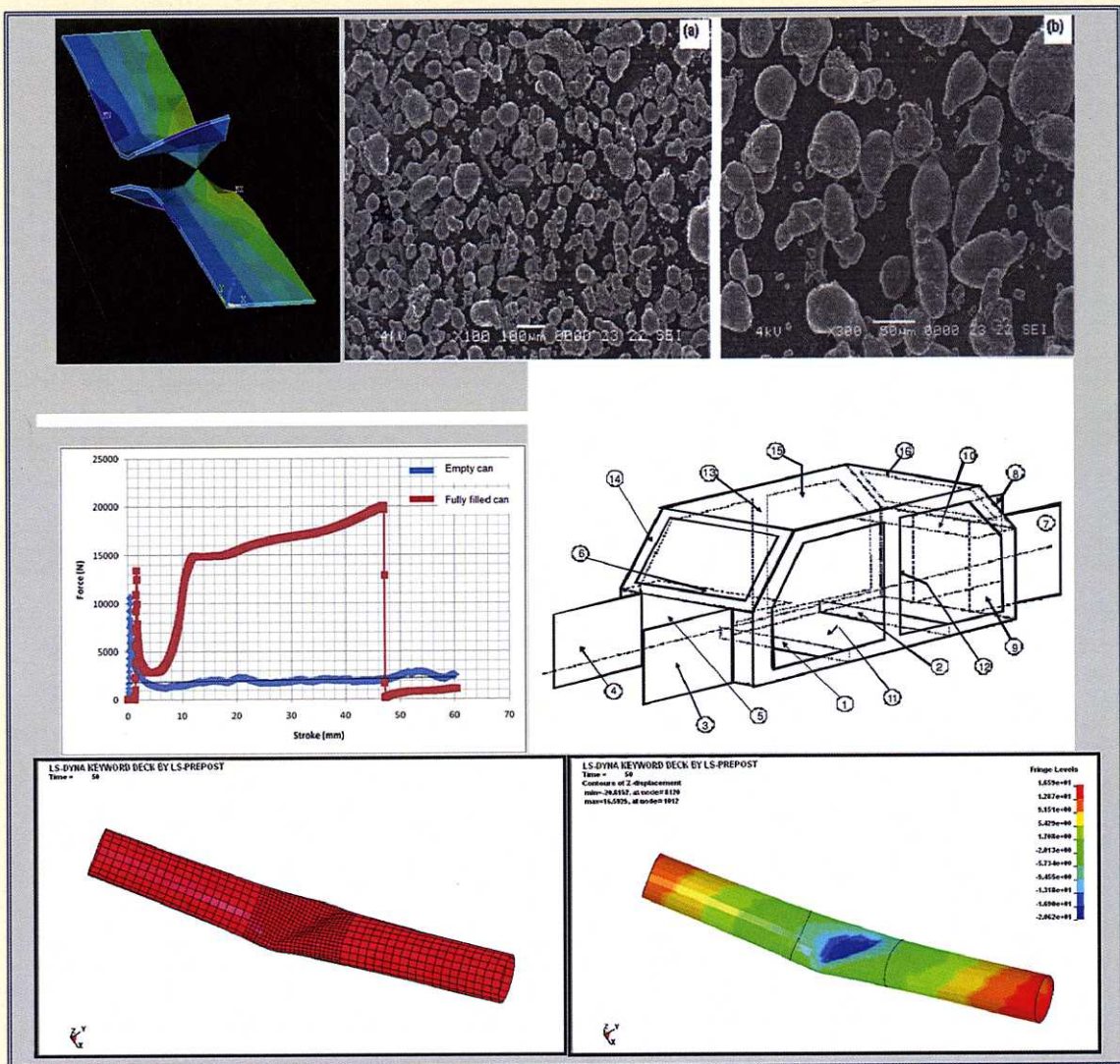


ADVANCED TOPICS IN MECHANICAL BEHAVIOR OF MATERIALS



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Meftah Hrairi



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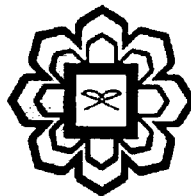
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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SIMULATION RESULTS OF PIPE WHIP IMPACT AT 55° ANGLE

Qasim H. Shah, Hasan M. Abid, Adib B. Rosli

1. INTRODUCTION

The safety of pipe whip is related issue for nuclear power and chemical plants, where pipes are often used to transport fluids at high pressure and high temperature. Simulation analysis for empty pipe and liquid filled pipe are conducted in this study. The model was made of simple pipe whip system which enables the missile pipe to hit the target pipe at an angle of 55° oblique impact. The simulation setup is done by LS-DYNA which is highly nonlinear transient dynamic finite element analysis using explicit time integration. The results show the deformation occurred in the pipe whip at different degrees of impacts.

2. LS-DYANA SIMULATION RESULTS

2.1 *Simulation Results for Empty Pipe Whip Oblique Impact at 55° Angle*

The following figures shows the deformation occurred in the empty pipe whip as a result of oblique impact of 55° Angle. The figures present the final shape of the pipe, reduced diameter, dent width, pressure, von Mises stress, and displacement as follow,

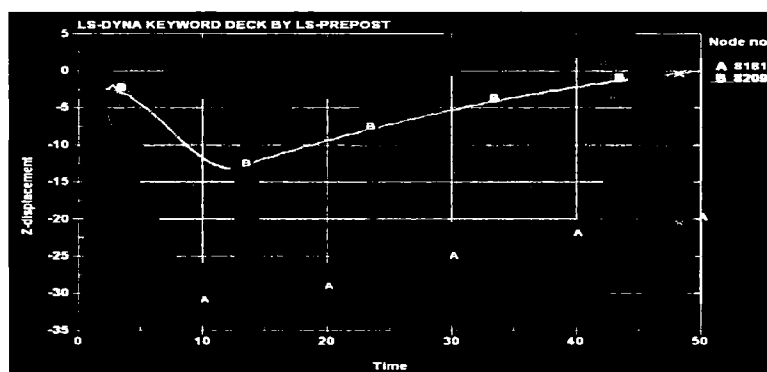


Figure 1 Graph of the reduced diameter