Playground Safety Evaluation

Background

Each year approximately 205,860 preschool and elementary children receive emergency department care for injuries that occurred on playground equipment. From January 1990 to August 2000, the Consumer Product Safety Commission (CPSC) received reports of 147 deaths to children younger than 15 that involved playground equipment. Injuries to the head and face accounted for 49% of the total injuries to children 0-4, while injuries to the arm and hand accounted for 49% of injuries to children ages 5-14. For children ages 0-4, climbers (40%) had the highest incidence rates, followed by slides (33%). For children ages 5-14, climbing equipment (56%) had the highest incidence rates, followed by swings (24%). Falls to the surface was a contributing factor in 79% of all injuries. Most injuries on public playground equipment were associated with climbing equipment (53%), swings (19%), and slides (17%). Data reported in Tinsworth, D. and McDonald, J. (April 2001). Special Study: Injuries and Deaths Associated with Children's Playground Equipment. Washington, D.C.: U.S. Consumer Product Safety Commission.

Figure 1 – Playground Equipment to be Considered
Assignment - Develop a procedure to measure acceleration response of children subjected to playground fall situations (Tues AM slide; Tues PM swing; Thr AM round-a-bout -- see Figure 1)

A measurement procedure is needed to satisfy the intent of the ASTM standards regarding children falling in playgrounds. The intent is to devise experiments to test the deceleration of a child hitting the ground after falling or jumping off a ride. Identify the maximum accelerations anticipated in a child fall. Develop data acquisition system to measure response. Collect data, analyze and interpret to determine potential for serious injury. Specify surface mediums to mitigate injury as result of common falls.

Playground Safety - [http://www.uni.edu/playground/resources/statistics.html](http://www.uni.edu/playground/resources/statistics.html)

There is a need to evaluate playground conditions for safety concerns. An ASTM standard exists for testing playground surfaces. The generic procedures call for accelerometers mounted in spheres of a given weight to measure response. These protocols should be considered but it is also necessary to evaluate alternate methods of testing since the ASTM procedure needs to be revised and newer testing methods will be considered.

Equipment

The DACTRON portable FFT analyzer can be used for acquisition – or PC with NI card and Labview.

Post Analysis and Report

The report should address (but is not limited to) the test setup, test procedure developed, measurements made, numerical processing of the data, problems associated with the data collection and/or reduction, recommendations for improvement/upgrade of playground equipment, enhancements suggested for the ASTM specification, etc. Weekly progress reports should be written to monitor the status of work performed (one page max)

References – (available in ME Lab)
