

## VIII. Future additions to RP J2249

As can see in Appendix A, industry standards on wheelchair occupant protection are in various stages of completion. The work on any one set of standards is rarely ever complete. This is also the case with J2249. The present version, which is the core topic of this guideline is only just the being of what will hopefully be a series of standards that addresses many remaining unresolved wheelchair securement concerns. First, J2249, only addresses the issue of frontal impact. Although much less in frequency, impacts from other directions (side and rear) also occur under normal driving conditions. It is highly suspected that wheelchair-seated occupants will have less protection when impact forces are applied in those directions, because securement and restraint current systems have been optimized for frontal impacts. New tests procedures will be required in order to validate the crashworthiness of products when non-frontal crash loads are applied.

Although attempts have been made to make J2249 generalized to allow testing of docking systems, much less experience has been obtained with these devices and therefore revisions to J2249 may be required as more experience is gained with docking technologies.

The essence of J2249 is its standardized 30mph, 20g threshold crash test using a 85kg (187 lb) surrogate wheelchair occupied by a 76kg (167 lb) male ATD. It is known that there are power wheelchairs heavier than 187 lb being routinely used in the marketplace. However, the above crash loading approaches the limits of exiting four point strap technology. Over time, as the industry increases the strength of their tiedowns, the mass of the surrogate will likely need to be revised upward and thereby more closely representing the loads imposed by these heavier wheelchairs.

As indicated, J2249 uses a 30mph, 20g crash pulse. This is a world-wide motor vehicle industry standard that is more appropriate for small vehicles than it is for large vehicles. For example, it is statistically most unlikely that a wheelchair used in a large transit vehicles will ever see 20g loads, due to the large mass of the vehicle compared to others with which it may collide. Therefore, there is need for a new test and standard for those securement devices that are designed to only be used in large public vehicles.

Docking securement technology offers the real promise of providing securement independence for wheelchair users. However, one severe impediment to the development of docking devices is the wide range of wheelchairs in the marketplace. That is, there is no agreed upon standard way in which wheelchairs will connect to vehicle-anchored docking-type securement devices. Development of a universal interface hardware standard will go along way towards resolving this problem. Plans are currently underway to initiate this important activity.