

## EXECUTIVE SUMMARY

Previous HSE fall-arrest research as documented in research report Nos 258, 657 and RSU 290 recorded a large number of serious test failures. These test failures could have resulted in fatalities or very serious injuries in a real life situation and are directly related to safety-critical omissions in harmonised European standards.

One group of tests as reviewed in the above research investigated the performance of fall-arrest systems (FAS) when mounted on a fixed, vertical ladder, by simulating realistic falls away from the ladder using an anthropomorphic test dummy (ATD). The tests revealed that the locking mechanisms in certain arrest devices were prone to non-operation, or delay in operation, due to the motion of the fall away from the ladder, and is a factor that had been considered in a number of European accidents.

Another group of tests discovered that certain types of full body harness, as worn by a user of a FAS, had poorly designed strap arrangements. In these tests the straps migrated out of position to such an extent that the ATD's neck became either severely garrotted or pressurised on the side of the neck, which would have been positively life-threatening in a real situation.

A further group of tests investigated the performance of retractable fall-arresters, and discovered that in certain realistic lifeline configurations they were unable to arrest a fall, which is their basic purpose.

This situation created the need for more comprehensive test methods and criteria. Five main areas were identified from the recommendations made in the research reports, and were used as the basis to generate new fall-arrest test methods and criteria. These new test methods and criteria are documented as stand-alone documents in Annexes A - E.

In Annex A the tests assess retraction and arresting performance in situations where the lifeline of a retractable fall-arrester may be partially or near-fully extracted, and where it may be at its maximum permitted cone angle.

In Annex B the tests assess critical movement of full body harness straps.

In Annex C, D and E the tests assess the response of three different kinds of ladder-mounted FAS to four potential body motions that could occur from ladders in falls, particularly the falling-backwards and sideways motion that results when both handholds are lost.

The intention of the new test methods would not be to replace current European standards, nor to affect the need to carry on using current European standards as a means to gain CE conformity, but to provide a supplementary means to assess certain vital aspects of fall-arrest performance that European standards presently do not.