Rescue 3 Instructors Conference

Quick Release Harness Performance

Chris Onions and Loel Collins
• What?
  • German paddlers in 1960s
  • 1980’s Wild-water and HF QRH
  • Back-bar, 1990’s

• Why?
  • Anecdotal inconsistent performance of the quick release harness
EN 12402 : 2006 Part 6
Quick release harness

• The harness must be functional within a range of 250 – 2500N
• No more than 110N to activate the device
• Must deploy within 10s
Initial Investigation (2009-2010)

- Range of commercially available PFDs
- 70 tests were conducted
- 17 releases were unsuccessful

1 in 4 or 25% didn’t work properly

Onions and Collins (2013a) IJES
Why?

- Design
- User
- Environment

- Onions and Collins (2013a)
- Collins and Onions (2013b)
- Pre constructed V-rig
- Calibrated channel
- PFD
- Load cell
- Video
- Interview

### Test configurations

<table>
<thead>
<tr>
<th>Series</th>
<th>Tape</th>
<th>Tri-bar</th>
<th>Tail Length (cm)</th>
<th>PFD Loops</th>
<th>Release mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Passive</td>
<td>Y</td>
<td>38</td>
<td>All threaded</td>
<td>Tape</td>
</tr>
<tr>
<td>2</td>
<td>Passive</td>
<td>Y</td>
<td>38</td>
<td>All threaded</td>
<td>Toggle</td>
</tr>
<tr>
<td>3</td>
<td>Passive</td>
<td>N</td>
<td>10</td>
<td>All threaded</td>
<td>Toggle</td>
</tr>
<tr>
<td>4</td>
<td>Active</td>
<td>Y</td>
<td>10</td>
<td>All threaded</td>
<td>Toggle</td>
</tr>
<tr>
<td>5</td>
<td>Active</td>
<td>Y</td>
<td>10</td>
<td>Dorsal loops only</td>
<td>Toggle</td>
</tr>
</tbody>
</table>
Passive, 38cm, Tri-bar: Tape release
Passive, 38cm, Tri-bar: Toggle release
Passive, 10cm, Tri-bar: Toggle release
Passive, 10cm, No-Tri-bar: Toggle release
All Tape releases
Passive, 38cm, with and without Tri-bar: Toggle release
Passive, 10cm, with Tri-bar: Toggle release

The length of tape through the mechanism MUST be less than the arc in the release.
Toggle Release

Tape through the mechanism MUST be less than the arc

? Multi context, multiple users
HARNESS NEEDS TO BE ADJUSTABLE.
Sized when fitted
Toggle Release
Tape adjusted, including tri glide, through the mechanism MUST be less than the arc at release
Harness sized and adjusted at time of donning pfd
There still has to be a load at the dorsal point on the PFD for this to work!

- Star shapes

IN LOW FLOW CONDITIONS GREATER LOAD CAN BE CREATED ON THE RELEASE MECHANISM BY MAKING A STAR SHAPE FOLLOWING RELEASE

??
There still has to be a load at the dorsal point on the PFD for this to work!

• Pre-loading

Difficult to adjust tape length
Design and standard

IN ZERO FLOW CONDITIONS, 20CM OF TRAVEL CREATED IN THE HARNESS BY INTEGRATING ELASTICATION SYSTEM INCREASES THE SEPARATION OF THE COMPONENTS
There still has to be a load at the dorsal point on the PFD for this to work!

IT TAKES THE SAME LOAD TO SEPARATE THE TWO VELCRO PARTS AS THE PFD PROVIDES IN FLOATATION AROUND 50-60N
What can you do?

- Personal kit
  - Go home and trim it.
  - Cut off the Velcro
  - Change the threading of the PFD
  - Pull the toggle!

- Team Kit
  - Go back to base;
  - Cut off the Velcro
  - Change the threading of the PFD
  - Pull the toggle!

Retrofit;
- Adjustable tape length
  - Pre tension harnesses
IF THE HARNESS IS SET UP AS RECOMMENDED THE TRI-BAR CAN BE INCLUDED IN ALL APPLICATIONS

Can the rescuer take it?
Other consideration

- Professional Judgement and Decision Making
- PFD design
- Connection to line
- Maximum load capability
Q’s ?????