

## **RF3.0 FINAL CONSENSUS STATEMENT**

### **CHECKLISTS:**

The forum acknowledged the overwhelming evidence demonstrating the efficacy of checklists in preventing errors in parallel fields that share similar technical complexity. Two recommendations regarding checklists were consequently agreed:

1. The forum recommends that rebreather manufacturers produce carefully designed checklists, which may be written and / or electronic, for use in the pre-dive preparation (unit assembly and immediate pre-dive) and post-dive management of their rebreathers.
  - Written checklists should be provided in a weatherproof or waterproof form.
  - The current version of these checklists annotated with the most recent revision date should be published on the manufacturer's website
2. The forum recommends that training agencies and their instructors embrace the crucial leadership role in fostering a safety culture in which the use of checklists by rebreather divers becomes second nature.

### **TRAINING AND OPERATIONS**

1. The forum applauds and endorses the release of pooled data describing numbers of rebreather certifications by training agencies, and encourages other agencies to join ANDI IANTD, and TDI in this initiative.
2. The forum endorses the concept of making minimum rebreather training standards available in the public arena.
3. The forum endorses the concept of a currency requirement for rebreather instructors. We recommend that training agencies give consideration to currency standards in respect of diving activity, class numbers, and unit specificity for their instructors.
4. The forum recognizes and endorses the industry and training agency initiative to characterize "recreational" and "technical" streams of sport rebreather diver training. These groups will have different operational, training and equipment needs.

## **ACCIDENT INVESTIGATION**

1. The forum recommends that training agencies provide rebreather divers with a **simple list** of instructions that will mitigate common errors in evidence preservation after a serious incident or rebreather fatality.
  - These instructions will be developed under the auspices of the Undersea and Hyperbaric Medical Society Diving Committee in consultation with the relevant RF3 presenters.
2. The forum endorses the concept of a widely notified centralized “on-call” consultation service to help investigators in avoiding errors or omissions in the early stages of a rebreather accident investigation, and to facilitate referral to expert investigative services.
3. The forum recommends that in investigating a rebreather fatality the principal accident investigator invite the manufacturer of the incident rebreather (or other relevant equipment) to assist with its evaluation (including the crucial task of data download) as early as is practicable.
4. The forum endorses the DAN worldwide initiative to provide a means of on-line incident reporting with subsequent analysis and publication of incident root causes.

## **DESIGN AND TESTING**

1. The forum recommends that all rebreathers incorporate data logging systems which record functional parameters relevant to the particular unit and dive data, and which allow download of these data. Diagnostic reconstruction of dives with as many relevant parameters as possible is the goal of this initiative.
  - Footnote: An ideal goal would be to incorporate redundancy in data logging systems, and as much as practical, to standardize the data to be collected
2. The forum endorses the need for third party pre-market testing to establish that rebreathers are fit for purpose. Results of a uniform suite of practically important unmanned testing parameters such as canister duration, and work of breathing (qualified by clear statements of experimental parameters) should be reported publicly. Ideally, this testing should be to an internationally recognized standard.
3. The forum acknowledges recent survey data indicating a poor understanding of rebreather operational limits in relation to depth and carbon dioxide scrubber duration among trained users, and therefore recommends: 1. that training organizations emphasize these parameters in training courses. 2. that manufacturers display these parameters in places of prominence in device documentation and on websites.
4. The forum strongly endorses industry initiatives to improve oxygen measurement technologies, and advocates consideration of potentially

beneficial emerging strategies such as dynamic validation of cell readings and alternatives to galvanic fuel cells.

5. The forum identifies as a research question the issue of whether a mouthpiece retaining strap would provide protection of the airway in an unconscious rebreather diver.
6. The forum identifies as a research question the efficacy of a full face masks for use with sport rebreathers.