

The Science Behind The IADRS / NFPA 1670 Annual Watermanship Test

By: Lt. John A. Carney

The Public Safety Dive Rescue market for years lacked a performance benchmark that could serve to define diver fitness, comfort, and therefore operational competency. In response, I had the privilege of participating in the development of what has come to be known as the IADRS / NFPA Watermanship Test. That work took place over 3 years ago now as a component of the research project we conducted on diver stress and panic in cooperation with the Army's Combat Diver School in Key West Florida and the Emergency Medicine Research Department of Akron General Medical Center. The test was ultimately incorporated into the NFPA 1670 standard on dive rescue technician level competency approximately 2 years ago.



As sanctioned by the IADRS, and now as part of the NFPA 1670 standard, it has been gratifying to witness that Dive Rescue Teams have moved toward adopting the watermanship standard into their regional and local team protocols. As a co-developer of the test, I receive many emails and phone calls asking for clarification as to how the test provides an accurate perspective of a diver's gross cardiovascular fitness, as well as their general comfort level in the water. Team administrators also call with questions requesting clarification and specifics on how the test should best be administered. The purpose of this article is to provide answers to these same questions for the benefit of all the members of the PSD dive market, and readers of the Association News

Development Of The Test's Components

To begin, the IADRS / NFPA Watermanship Test represents a physical fitness test that is "task based". That means the test components are intended to represent actual aspects of our operational physical duties, which serves to increase the test's meaningfulness and usefulness to us.

Certainly, we can envision our divers surface swimming, hence the 500yd timed swim component; divers must tread water, hence the 15 minute tread; we swim search patterns using leg kick fin strokes while our hands hold a searchline and feel for the target while we conduct the pattern, hence the 800yd "legs only" snorkel component; and finally we could surface tow water accident victims to shore or, God forbid, a fellow distressed diver, hence the 100yd inert diver tow evolution.

The Test and Cardiovascular Fitness Assessment

The hallmark of our interaction with the United States military Naval Command was to realize the direct relationship between cardiovascular fitness, comfort in the water, and overall diver operational safety.

There is a wealth of Naval research that has been conducted in this area over the years which has served to examine the relationship between diver cardiovascular and mental fitness with the incidence of panic at depth during a diving operation. Plainly stated, fatigue is a proven trigger of panic, and panic can cause our injury or death during a dive.

It is reasonable to expect a PSD must be capable of managing the level of physical stress they could well encounter during their activities at depth. Correlation of this expectation to our PSD market has revealed that we must have the physical capacity to manage a 13-MET level of performance. "METs", or Metabolic Equivalents are a unit of measure common to medical cardiac treadmill tests. For a diver wearing full scuba gear, this equates to being able to sustain an underwater fin swimming speed of 1 knot. That equates to a 101 ft/min (9 min/mile) submerged swim speed.

Research has shown that a 10-MET capable recreational diver might hopefully dive adequately in calm waters unless they suffer an issue during the dive, such as having to swim back to a dive boat into a strong current at the end of a dive, or having to tow a tired dive buddy long distances. Even recreational divers should be more fit than this.

A typical recreational dive certainly does not represent an ordinary PSD dive! Considering we may potentially dive 24/7/365 in any weather condition or sea state with elevated emotions in Rescue Mode translates into the need for the higher MET level as our benchmark of fitness competency. In response to this fact, the Watermanship Test components have been designed to represent the 13-MET level of fitness competency.

Details Of The Testing Protocol

For a copy of the IADRS Watermanship Test, please refer to the IADRS website. It, along with a suggested Annual Scuba Skills Review are provided for download. Next, let's review the specifics of administering the Watermanship Test.

Test Site Considerations

First, you should select a pool test location that will provide you with accurate and reliable test data from year to year. Although outdoor pools are usable if no other option is available, an indoor pool provides a more stable environment, which helps to eliminate the negative impact that variable weather conditions can have on test candidate performance. No portion of the swim test should be conducted in an open water environment to maximize test candidate safety. The size of the pool should be sufficient to permit several test candidates to swim at one time, so that the entire team can be tested as expeditiously as possible.

The pool should have a deep end depth of at least 8 to 9 feet adequate to conduct the treading portion of the test, and swim lanes should be at least 25 meters in length.

Lastly, the pool location should facilitate transfer of the team's diving equipment onto the pool deck. It is optimum to arrange for access to the pool deck directly off a parking area where the team dive vehicle can be parked, as well as an EMS unit to service any emergency the team may suffer during the testing process.

It is strongly recommended an EMS unit with ALS capable crew be present at the pool testing site prior to the start of the test in the event of a candidate injury.

Administration Of The Swim Test

As a Dive Team Coordinator, I believe in "leading from the front". As such, I submit myself to the annual swim test with the rest of my colleagues on the team each year. As an active duty list diver, I believe I should fulfill the same fitness level requirements as the divers I administer. I strongly suggest all dive team coordinators share this same command philosophy.

We therefore have a FD administrative officer fill the roll of time and record keeper at the test site in addition to myself. Before the testing begins, I give a "warning order" which consists of asking if anyone present to take the test does not feel they can safely undertake the event due to illness or recent injury. If a diver has an active acute illness such as an upper respiratory infection or cold for example, I do not test them that day but rather wait till they are medically cleared to test.

All components of the swim test must be administered consecutively on the same day and location for it to be considered a valid test. The reason for this is that the cardiovascular stress of each component "builds" on the last component, just as it potentially would during an actual dive or surface water rescue operation.

The 500yd Timed Swim

Candidates should start all swim portions of the test in the water with a wall push-off authorized. Testing candidates must swim with a forward continuous stroke such as a crawl or breaststroke during this portion of the swim test. Do not permit candidates to use swim aids especially anything that provides any floatation such as a shortie wet suit top.

Any stopping, holding onto the pool deck, using a backstroke, or standing up in the shallow end during the swim other than momentarily pausing to turn and push off the wall during the act of turning should be documented as a failure of this evolution.

Upon completion of this portion, the candidates should be prompted to hydrate, and the next station should commence optimally within 10 minutes of the end of this station.

The 15-Minute Tread

Again, no use of swim aids are authorized for the tread. Candidates may tread in any manner desired, including floating, bobbing, or drownproofing. The last two minutes of the tread must be spent with both hands (not arms too) out of the water. Any inability to keep the hands out of the water during the last two minutes, or any holding onto the pool deck should be documented and the corresponding lower grade recorded.

The 800yd Snorkel Swim

The snorkel/fin swimming portion of the IADRS Watermanship Test serves to represent the level of lower body strength required of an operational PSD. We all fin swim during our dives--at times, very aggressively. Candidates should wear a dive mask with snorkel, but again, no floatation is permitted. Candidates start this portion of the swim test in the water, and may push off the wall during turns. NO use of arms other than that needed to re-orient oneself during the act of turning is permitted.

The 100yd Inert Diver Tow

This portion of the test should start within 10-minutes of the end of the snorkel. As such, gear packs should be prepped prior to the start of the swim test and be ready for the diver tow evolution. Divers should NOT wear any thermal protection for any portion of the test, especially this segment. The dive gear packs should be configured in a "recreational" format, without redundant pony bottles or full face dive masks such as a Divator II AGA. This will facilitate the use of the gear packs during this evolution as well as the scuba skills review which can be conducted after the completion of the swim test.

Watermanship Test Score Validity

We have reviewed swim test results and have obtained feedback from numerous public safety diving agencies over the last three years. This data has served to confirm the validity of the test scoring process and test criteria. Achieving the established cut score of 12-total points assures that the PSD possesses the minimum cardiovascular fitness level as well as a sufficient comfort level in the water to adequately perform as a Public Safety Diver in our dive market.

IN SUMMARY

I hope this article has answered your questions as to how the IADRS Watermanship Test was developed, and how it should be administered. The last subject that may be addressed in a future article is how to design a physical fitness program that will assist your members in passing this test. That information is available now within the "eBook" I recently had the privilege of co-authoring with retired USN SEAL officer Lt. Stew Smith. Visit www.StewSmith.com or www.HeroesOfTomorrow.org to access a PSD specific physical training program that will guide you in this effort. In the meantime, best regards and stay safe out there! John.

Lt. John Carney, EMT-P is the Director of the Summit County Technical Response Operations Team, Water Rescue Discipline in Akron, Ohio. He is a Corporate Trainer with Dive Rescue Intl, a lead instructor with the Akron General Medical Center Paramedic Education Program, and a board certified Advanced Diver Medical Technician. He can be reached at the following email address for questions or comments regarding this article:

jcarney@agmc.org