WILDERNESS SAR

PARKRANGERS, MOUNTAIN&CAVE RESCUE,WATER&HELI-OPS

ISSUE 13

WILDERNESS SAR

CONTENTS

13

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You can't breathe water

Will SWIFTWATER BREATHING APPARATUS be the game changer we have been looking for?

by **Dr. Steve Glassey PhD**

Dr Steve Glassey has been teaching swiftwater rescue for twenty years and is a registered assessor for the International Public Safety Qualifications Authority (IPSQA) for swiftwater rescue, a WorkSafe New Zealand Occupational Diver and is a PADI Public Safety Diver™.

This is a precis of a larger study that can be viewed via details shown at the end of this article.

The world of public safety is always evolving, with new techniques and equipment constantly being developed and refined. One of the most significant advancements in recent months is the evaluation of the Swift Water Breathing Apparatus (SWBA), a device that could revolutionize swiftwater rescue operations.

INTRODUCTION

In 1942, Jacques-Yves Cousteau and Émile Gagnan designed the first reliable and commercially successful open-circuit Self-Contained Underwater Breathing Apparatus (SCUBA), known as the Aqua-Lung. In 1945, Scott Aviation worked with the New York Fire Department to roll out the first widespread adoption of the AirPac, a Self-Contained Breathing Apparatus (SCBA) for firefighting. These innovations transformed their respective fields, and now, we stand on the brink of another game-changing innovation - the Swift Water Breathing Apparatus (SWBA).

THE CONCEPT OF SWBA

SWBA is a repurposed version of Emergency Breathing Systems (EBS) used by aircrew for escaping downed aircraft in water. EBS are mini-SCUBA systems that have been adapted for maritime and aviation emergencies. The key difference between SWBA and traditional SCUBA practice is that SWBA operates EBS without the intention to dive. Instead, it provides a few extra breaths of air,

enabling rescuers to perform surface level tasks in challenging conditions, such as navigating through a long set of rapids or escaping the deadly churn of a low head dam.

TRIAL & EVALUATION

Following initial trials in the United Arab Emirates, the formal trial of the Swift Water Breathing Apparatus (SWBA) was conducted at Vector Wero whitewater park in October 2023. The trial involved the use of various Emergency Breathing Systems (EBS) devices, including the HEED3, Tiger Performance EBS, and an improvised set using parts from various manufacturers. The Poseidon and Aqualung EBS underwent a desktop evaluation based on publicly available material and contact with their distributors.

The two Personal Floatation Devices (PFDs) used across all EBS for the trials were the NRS Rapid Rescuer and the Force6 Rescue Ops vests. The improvised set used an assortment of parts from different suppliers, including a reconditioned AquaLung ABS Octopus which unlike the other mouthpieces had a 120 degree angle between the hose and mouthpiece which made it easier to operate, stow and deploy when packed down the front of the PFD.

The trial found that the use of SWBA improved the operator experience significantly. The SWBA was donned at the start of the day's activities and worn to see if they impeded movements and

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found no such interference. The most common issues were cylinder pressure or volume, and mouthpiece orientation.

The conditioned practice of having a relaxed jaw holding the mouthpiece (2nd stage regulator) in SCUBA diving prompted minor change in behaviour with the need to apply additional bite pressure when passing through rapids and hydraulics as otherwise the mouthpiece was prone to being pulled out by the turbulent water. It only took one such experience to encourage adopting a firmer bite in subsequent runs of the whitewater channel.

All the products evaluated appear suitable for use as SWBA. Whether their individual manufacturers approve them for such use is not covered in this study. However, as all the proprietary devices are intended for escape purposes, they could be further modified to make them more suitable for swiftwater environments.

CHALLENGES AND CONSIDERATIONS

Despite its potential, the implementation of SWBA is not without its challenges. There are currently no standards for SWBA, and the standards developed for EBS are not suitable for swiftwater or the function that SWBA could play. Furthermore, the use of SWBA requires due diligence and legal advice before implementation.

To assist safe implementation a Good Practice Guideline: Swiftwater Breathing Apparatus has been developed. Under this guideline operators must be certified, which involves completion of a recreational dive medical, verification of recognized swift water rescue technician and Level 1 Supervised Diver (ISO) credentials, and passing an examination following the SWBA online course.

The online certification process for those holding their diver and swiftwater technician credentials is now available from the website below.

CONCLUSION

In conclusion, the potential of SWBA to revolutionize water rescue operations is undeniable. However, its implementation requires careful consideration of legal and operational factors. As we move forward, it is crucial to develop fit for purpose SWBA products and ensure that operators are adequately trained and certified. With these measures in place, SWBA could indeed be the game-changer we have been looking for in swiftwater rescue operations.

To access full details on the evaluation including videos, Good Practice Guideline, SWBA® online course and further information, visit ***www.swba.tech***

TRAIN IN SAFETY AT THE NEWEST FACILITY IN THE USA

In an increasingly flood-prone world, swift water rescue training is critically important for first responders. specialized training can often be difficult and dangerous to arrange in natural outdoor settings.

In spring 2023,*Fayetteville Technical Community College* (FTCC), already known for its educational and training services to *Fort Bragg*, opened the only indoor swift water rescue training facility on the east coast of the United States.

An 88,000-gallon indoor tank allows for a variety of training scenarios, including different weather, water temperatures, obstacles, and rescue challenges, including simulated rescues at night. Located on FTCC's 30-acre state-of-the-art *Fire & Rescue Training Complex* on Tom Starling Road in Fayetteville, North Carolina.

Learn more https://www.faytechcc.edu/swrtf

TIPS for incident management of SAR operations

by Dr. Steve Glassey PhD

Dr Steve Glassey has been teaching swiftwater rescue for twenty years and is a registered assessor for the International Public Safety Qualifications Authority (IPSQA) for swiftwater rescue, a WorkSafe New Zealand Occupational Diver and is a PADI Public Safety Diver™.

About 15 years ago when I was instructing an incident command course at RNZAF Base Ohakea when I found that students sometimes become overwhelmed with all the information and injects coming in during the tabletop exercises. The air force participants were not alone; in fact, highly complex novel scenarios often overwhelmed even experienced public safety leaders both operationally and in training that I have observed over the years. My mantra is to always set up participants in exercises to succeed, even if just marginally. Exercises should be used to build confidence, and you want these people to feel they have the ability to take on whatever challenges they may face. No one wants to have "that" pilot who has an emergency but failed that exact scenario 9 out of the 10 times they rehearsed it in a simulator, right?

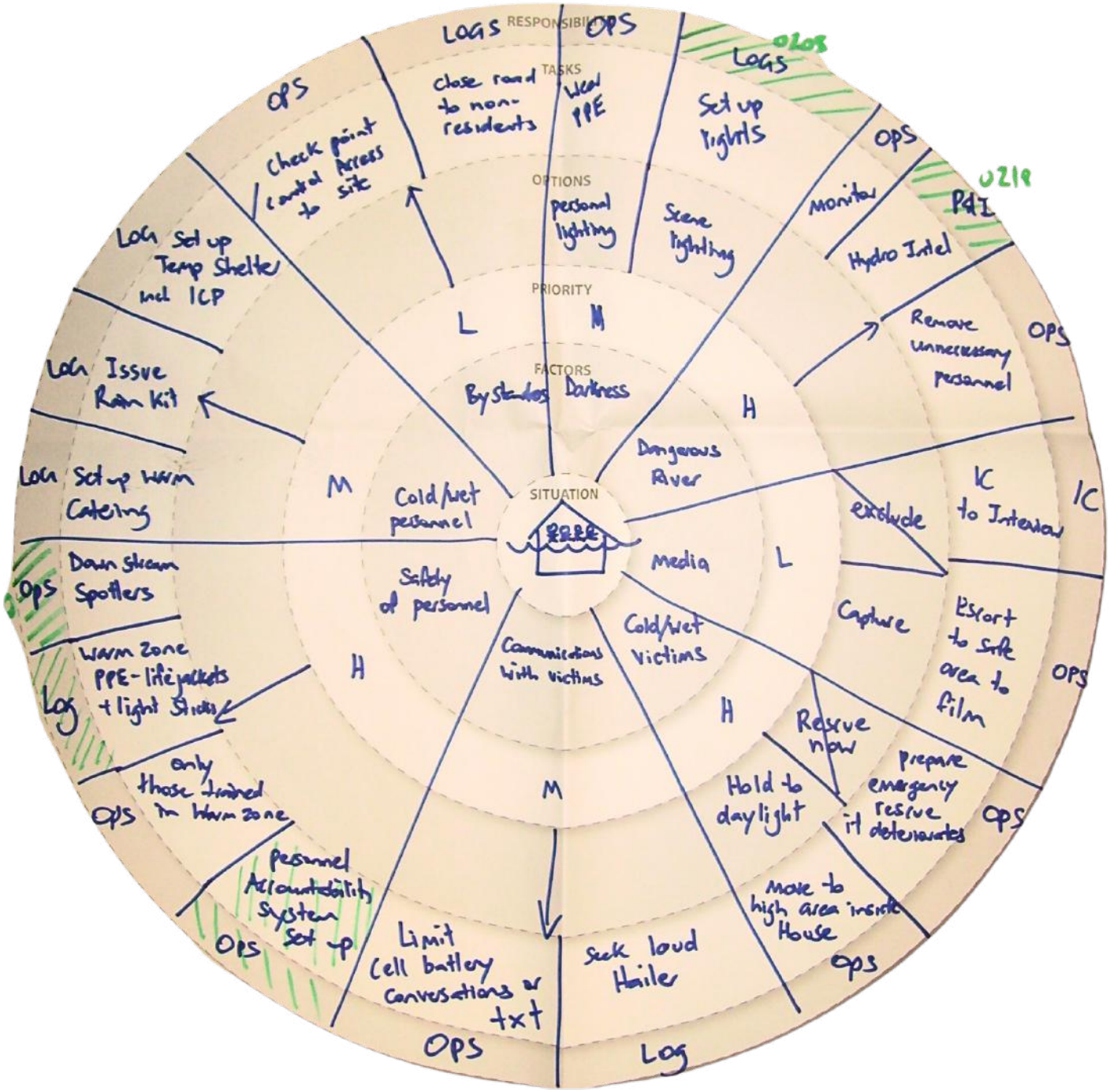
This sense of feeling overwhelmed is likely not because of incompetence, but more so the reality of being human. We are wired to be mono-taskers, with only 2.5% of us actually able to multitask effectively. The University of Oregon has concluded that the human brain has a built-in limit on the number of discrete thoughts it can entertain at one time. The limit for most individuals is four (Awh & Vogel, 2008). Once this limit is exceeded, the efficiency and quality of our mental efforts start to deteriorate. And in complex emergencies, we surely have more than four things to worry about.

I tried out a modified mind mapping method and aligned it to incident action planning to create a visually collaborative process known as TIPS, the Targeted Incident Management System. Targeted because it looks like a bullseye or target map, starting off with a small number of factors identified for a situation that then extrapolates out with compounding information until tasks are assigned and tracked. The incident management team, with the leader taking charge of the pen usually on a whiteboard or large sheet of paper, focuses the conversation on getting a common understanding of the situation. From there, the group identifies the factors affecting the situation, which are really all the things that they are worried about. Then we assign a priority to each factor. The priority is subjective and contextual, using a simple low, medium, and high rating. The only rule in this phase is that everything cannot be a high priority. Then the group discusses what the options are to treat the factor, such as evacuate or shelter-in-place. The best option(s) are then chosen to extrapolate with tasks to enable that option's execution. Those tasks are then assigned to a member of the incident management team. Those team members now have a set of tasks, with an assigned priority to work on. The leader may have tasks but can now monitor progress of their direct reports who can naturally delegate their tasks accordingly. Using a whiteboard creates shared situational awareness of the incident and how their tasks relate to others and the overall priorities. At the end of the process, a structured briefing can be given and even transposed onto formal incident command planning forms.

In the example opposite, based on a real event, occupants of a house are stranded in a flood with waters rising in darkness and stormy weather. The green shaded sections indicate when the person responsible has completed the task so the leader can easily track progress.

Recently, I had the opportunity to show this tool to emergency managers in the United Arab Emirates, and given Arabic text reads right to left, the tool also being so visual was very well received (in fact, it was the best tool they took away from the multi-day course they said). It allows for different languages, and when given an impromptu exercise on a Tsunami warning, the groups came up with a detailed incident action plan within minutes. The other benefit is that it can be used Business-As-Usual for any planning, from events to project management, and in doing so ensures participants are constantly refreshing in its use and no longer trying to remember a planning tool they learned on a course months or years ago.

What I have found interesting is giving people highly novel scenarios, as where familiar scenarios are given, people default



to previous experience. But when the group does not have that experience, that is when the overloading is exacerbated, and performance deteriorates. By using scenarios like a zombie apocalypse or alien invasion, participants focus on using the system and becoming proficient in it, leading to a point where they often say, “We don’t care what the scenario is, it doesn’t matter. What matters is we can apply a structure to any scenario.” Yes! An all-hazards and all-phases tool! And it can be used regardless of the incident management model you use, AIIMS, CIMS, GSB, NIMS, ISO etc. So let it be a search and rescue from swift water through to a zombie apocalypse, TIPS can provide a tool to focus the incident management team to create a collaborative and rapid action plan.

Learn how to use TIPS today by visiting www.publicsafety.institute/tips or scanning the QR code below to watch a 2-minute video – yes, it's that simple! If you have a group that would be interested in participating in a study to help evaluate the effectiveness of TIPS or have any further questions on the system, please email me at steve@publicsafety.institute.