

## **Chapter 1 – Introduction to the RTO Technical Course: Survival at Sea for Mariners, Aviators and Personnel Involved in Search and Rescue – HFM-106**

by

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(Course Director)

Your Course Director had the privilege of being taught by such scientists as Peter Barnard, Peter Bennett and David Elliot when he attended his basic Royal Navy Medical Officer Introductory Course in Alverstoke, Gosport, U.K. in 1966.

Then, the R.N. Institute of Naval Medicine was humming with expertise. Many of the staff there and next door at HMS Dolphin had Second World War expertise in survival medicine, and the new nuclear medicine submarine programme had been operating for about 5 years. The Royal Navy Personnel Research Committee met regularly. At this time, it was possible to personally discuss problems with distinguished working scientists such as Hervey, Keatinge, McCance, and Pugh. These were the people who changed our whole mind set about death at sea. Now, we knew it was a series of physiological responses that needed to be addressed by the World's Navies and Industry with better protective clothing, e.g. lifejackets and survival suits. The term hypothermia first came into our survival language. Moreover, the scientists brought about a whole attitude change which was needed in our Survival Training Schools; no longer was drowning due to fate and an acceptable occupational hazard. People could be saved during the survival phase of marine abandonment.

In 1981, it was Golden and Hervey who then made the next significant step forward in cold water physiology. They published the classic work on the four stages in which death can occur from sudden unexpected immersion in cold water. Up until then, our pioneers considered that hypothermia was the most important cause of death after shipwreck. Cold shock and swimming failure were known, but were only considered of academic interest. Even though this was 26 years ago, this information is still only just becoming widely known and the concept applied. Things don't happen very quickly in the marine world!

Over the last 41 years, I have watched this change in philosophy occur. In a small part, I have been able to assist particularly in the human factors of escape and survival from helicopter ditchings and the introduction of emergency breathing systems. As time marched on, it became clear to me that the celestial umpire was calling in many of these experts; we thought they would be there forever to provide their wisdom and advice. Sadly when they retired or died, the universities did not replace them. For some reason, human physiology is considered to be a mature science (not by me!). Many University Faculties consider it is much easier to replace the scientists with mathematical modelers.

In the 21<sup>st</sup> Century, this of course is the path of least resistance, no need for human ethics committees, models take up much less space than elegant pools, wave tanks, cold chambers, no worries about litigation because no-one gets a non-freezing cold injury and no-one slips on a wet pool deck, etc. Now, for instance here in Canada, all of a sudden, we find that 7 very fine University laboratories producing excellent applied physiological work reduced to only half of this capability, if not less. Canada is not unique, the USA and European countries have had the same experience. We will likely live to regret this decision.

As Burton and Edholm had done reporting on all the 2<sup>nd</sup> World War work in their book “Man in a Cold Environment” in 1955, this author seeing the writing on the wall asked himself how could we at least document our current survival knowledge learned since then. This would ensure that it could be passed on to future generations with steady updates as more information became available. The loss of hundreds and thousands of sailors would then not have been in vain, and the contribution of many hundreds of test subjects post-war enduring very unpleasant cold water experiments would also be recognized. The research is documented in a Transport Canada report No TP13822E – Survival in Cold Waters – Staying Alive. This is free both in English and in French to anyone who wishes to email and request a copy from the Marine Safety Board of Transport Canada at [marinesafety@tc.gc.ca](mailto:marinesafety@tc.gc.ca).

In conjunction with this, this author conceived the idea of a lecture series “Survival at Sea for Mariners, Aviators, and Personnel involved in Search and Rescue.” This was first sponsored by the NATO Advisory Group for Aviation Research and Development (AGARD) and now by the Human Factors Medicine Panel (HFM106) of the NATO Research and Technology Organization. My team have conducted the course in six countries over the last 4 years. It has been very well received. Indeed voted the best of all the RTO lecture series in 2005. Because it was a new concept, we simply presented our information on PowerPoint presentations. These were made available to all the students. For the first time in 2007, we have produced a bound volume with a précis of each lecture. I hope you enjoy the course.

Please note that the Programme is very flexible and there is a very good reason for this. Before we arrive at a venue we have no idea of the professional background of the students, their knowledge of the English language and at what level to aim our training. This is because (a) we teach a wide range of topics and (b) our audience comes from an even wider professional and practical background. So for instance in one location, the majority of attendees were physicians, nurses and medical technicians; in another location they were predominantly aircrew; and yet in a third location they were mostly aero-medical training staff. So thanks to Microsoft Power Point, when we review the list of attendees on the day before the course starts, it does not take long to re-arrange the slant on each topic to meet the knowledge levels of each of the audience. Because we only have two days to present the course at each venue, and there is only so much information that people can absorb in this time, we always run the risk of speeding over some topics which may be of more interest to some attendees. We do occasionally get comments on our course critiques saying “we would like more on this subject” or equally “we would like less on this subject and more on another”. I am afraid this is inevitable. However, there are two other good reasons for us to develop the lecture notes on each topic.

We made each lecture a stand alone lecture, so instructors could take the whole text and use it as they see fit. Because of this, you will notice that some data is repeated in each of the lectures. This is unavoidable because each of the topics we discuss which include clinical medicine, physiology, psychology, human engineering and practical survival examples and statistics are all interrelated. We make no apologies for this and strongly advise that anyone entering the field of survival instruction or research must have a broad knowledge in all these areas. To address one area without the others is doomed to failure.

The other reason is that we provide practical training on both afternoons of the course. However, for those who do not want to get wet, or only wish to observe one or two evolutions, then we offer additional classroom lectures and videos. Again in some venues, everyone wants to do the pool work and **additional** pool work. At the other extreme, only one or two people want to jump in! So the other objective of these lecture notes is that if you missed two or three lectures because you were in the pool, then you still have a copy to take home.

Finally, I made reference to my team above and now I must introduce them to you and thank my lecturers who have given their personal time to do this lecture series for you:

- Dr. Mike Tipton
- Dr. Bob Cheung
- Dr. John Kozey
- Mr. Peter Gibbs

I would also like to introduce a new addition to our family, Dr. Tara Reilly. She has worked under all of our supervision over the last 6 years and will also be lecturing on the course.

Finally I have to thank Jackie Jenkins and Conor MacDonald, our graduate students from the Faculty of Health and Human Performance at Dalhousie University, Halifax, Nova Scotia, who have typed out and formatted all the lectures ready for RTO to assemble in one publication. As well I would like to thank Antonio Simoes Re from the Institute for Ocean Technology for providing me with the wonderful photograph below of testing a TEMPSC in ice conditions off the coast of Newfoundland.



**Figure 1-1: TEMPSC Testing in Ice.**

This may happen to you – So read, mark, learn and inwardly digest the contents of this AGARDograph.

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