DANGERS ENCOUNTERED DURING LONG-DISTANCE SWIMMING AND THE SAFETY MEASURES APPLIED BY SWIMMERS ON THE EXAMPLE OF THE ENGLISH CHANNEL

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ABSTRACT

The dangers encountered during open water swimming are especially risky for swimmers. What hampers swimming most is low water temperature. Among other significant obstacles there are water salinity, waving, variable weather, and strong currents, which make it impossible to keep the intended swimming direction and reach the coast. As a result, people swimming across the English Channel cover an up to 50 kilometres longer distance. Swimmers often go through straits and channels occupied by very intensive shipping.
The most serious dangers during open water swimming include sharks and jellyfish. All these hazards can seriously threaten the swimmers' lives. The concern for own safety requires the danger identification, risk level assessment, and developing a plan of action that would take the accepted risk into consideration. In the paper, the above mentioned dangers and applied safety measures were analysed. The authors made use of source material, including the personal experience of Bogusław Ogrodnik gained during the successful attempt to swim across the English Channel in summer in 2014.
Key words: swimming marathons, threats, risk management.

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INTRODUCTION

Safety in various forms of physical activity is considered to be a significant field of interest of scientific research. The subjects of study are those areas, where life and health are at risk.

The majority of attractive activities in sport, tourism and recreation are accompanied by eventuality of an accident. Although this risk cannot be entirely eliminated, it is essential to limit its level and mitigate the effects of potential threats. The risk is not pejorative and can be managed effectively by application of appropriate procedures [1].

The understanding of the nature of risk allows to reduce hazards without abandoning the goals set beforehand.

The strategies mentioned in this study (transfer, compensation, contingency plans, risk avoidance) serve this purpose. They require empirical evidence. What emerges here, is the problem of the effectiveness of the applied methods, forms and safety measures for sportsmen[1]. The aim of the study is to review and analyze the value of safety measures utilized in open water swimming.

Water environment is a place of pleasant and joyful way of spending leisure time. It is also an arena for strenuous struggles of the open water swimmers.

Open water swimming is a discipline where people swim in reservoirs such as oceans, seas, bays, lakes, and rivers [2]. It is a recently emerged discipline, although its traditions date back to the ancient times. The excellent swimmers of those times were Assyrians (880 BC), Egyptians or Japanese [3].

One of the most famous Greek myths is the story of Leander who swam across the strait of Dardanelles (Hellespont) to meet his beloved Hero. Dardanelle is a Mediterranean strait, one of the Turkish Straits, between the Balkan Peninsula and Asia Minor, connecting the Sea of Marmara and the Aegean Sea; length 120,5 km, width 1,3–18,5 km, depth 53–106 m [4]. Many artists have been inspired by the Leander's story. Lord Byron himself was among those who crossed the Dardanelle [5].

First swimming competitions, including the Olympics, took place exclusively in open waters, in 1986 (Athens) in the Mediterranean Sea and in 1900 (Paris) in the Seine. Nowadays, also at the World Championships, the long distance swimmers swim in open waters, covering the distances from 5 to 25 km [2,5].

The direct reason to study this subject was the challenge completed by Bogusław Ogrodnik, who on 26/27 July 2014 swam the English Channel. The struggle with the course lasted for 20 hours. His experience constitutes a rich source of additional information about risk and safety in extreme sports [6].

THE ENGLISH CHANNEL – EVREST OF SWIMMING

It connects the North Sea and the Atlantic Ocean by the Strait of Dover. Its width in the narrowest place, i.e. between the famous white cliffs of Dover and French Cap Gris Nez (Grey Nose Cape) near Calais, is 34 km (21 miles). In summer, water temperature fluctuates there between 15 and 17 degrees Celsius [7].

The first man in history who crossed the English Channel was Captain Mathew Webb.

He successfully completed the distance on 25th August 1875 in his second attempt. Webb swam 21 hours 45 minutes without support of any supplementary equipment. Strong currents and a slow pace (breaststroke and trudgen) caused the simmer to fulfil a distance of 64 km in the Channel that is 34 km wide [5, 8, 9]. An average distance for the adventurers facing the English Channel is approx. 50 km.

In 1926 Gertrude Ederle, a first woman in history, swam the English Channel. It was her second attempt, as in Webb's case. Gertrude Ederle was an American swimmer, three time medallist of the Olympics in Paris in 1924.

She covered a distance of about 65 km in a record time 14 hours and 31 minutes, using front crawl. Her record had not been broken until 1950. Ederle set out from French coast (Cape Gris-Nez) and finished in England near Kingsdown [5,9,10].

Since then, the English Channel has been crossed 1900 times. 1530 swimmers from all over the world have challenged these waters, among whom eight Poles. Polish "conquerors" of the English Channel are:

- 1975 – 30th August Teresa Zarzeczańska - 11 hrs 10 min,
- 1978 – 12th August Romuald Szopa - 12 hrs 49 min,
- 1990 - Lucyna Krajewska - 12 hrs 29 min,
- 2010 – 23rd July Paweł Nowak - 12 hrs 59 min 51s,
- 2013 – 22 nd August Grzegorz Radomski - 11 hrs,
- 2013 – 26 th August Damian Wachowicz - 15 hrs 32 min,
- 2014 – 26 th July Bogusław Ogrodnik – 20 hrs 33 min,
- 2014 – 20 th August Bogusław Woźniak – 12 hrs 56 min.[9].

The swimmer with the longest swim time is a British, Jackie Cobell, who in 2010 swam for 28 hours and 44minutes. The fastest was Grimsey Trent, 6 hours 55 minutes in 2012. Alison Streeter, a British, who has swum the Channel 43 times, more than anyone in the world, earned a title of the Queen of The English Channel. The King of The Channel is Kevin Murphy, the President of the Channel Swimming and Piloting Federation, with 34 swims. There have been 41 double-channel swims and 3 triple-channel swims [9].

What can support the high level of difficulty of the English Channel swims, is the fact that famous American swimmer Diana Nyad, who in 2013 swam 150 km from Cuba to Florida, had attempted to cross it several times, unsuccessfully [12]. The biggest hazards for swimmers crossing the English Channel are:

- hypothermia connected directly with a long time spent in cold water,
- injuries induced by performance of tens of thousands of continuous strokes;
- poisonous jellyfish and other sea life,
- busy shipping lanes (approx. 300 ships per day),

- rapidly changing weather conditions.

According to one hundred years old rules and regulations, the swimmers can only wear standard swimsuit, goggles and one hat. Silicone earplugs are permitted. It is allowed to grease the body with the mix of lanolin and Vaseline. During the swim, on average every 30 minutes the swimmer drinks warm isotonic drinks or hot tea with ginger served by the supporting team from the boat. Not only does it provide fuel for the body, but also
prevents from dehydration and hypothermia [9].

What Mount Everest is for mountaineers, the English Channel is for swimmers. The Channel, due to level of difficulty of the swim, is often compared to Mount Everest in the Himalayas. Even though it had been conquered 70 years earlier than Everest, two times less people have managed to cross the Channel than climbed the Roof of the World.

Both of the great attempts have been achieved for the first time by citizens of the English Empire (Webb, Hillary). Until recently, no man has managed to conquer these two Everests, the one in the mountains and the one in the open waters (although many have tried). It has been achieved by Bogusław Ogrodnik from Wrocław, Poland.

The English Channel swim is a part of the Ocean's Seven, the world's seven toughest swimming challenges, and Triple Crown (the English Channel, Catalina Channel and swimming marathon around Manhattan) [13, 14].

OCEAN'S SEVEN

The growing popularity of struggle with the immensity of seas and oceans, both individual and competitive, served as an inspiration for Ocean's Seven that emerged in 2007, idea based on the concept of the Seven Summits – similar challenge functioning among mountaineers. Ocean's Seven consists of 7 courses in open waters: the North Channel (Great Britain, 35 km), the Cook Strait (New Zealand, 26 km), the English Channel (Great Britain, France, 34 km), Molokai Channel (Hawaii, 42 km), the Catalina Channel (USA, California, 34 km), Tsugaru Strait (Japan, 21 km), the Strait of Gibraltar (Spain, Morocco, 18 km). The first man to complete the Ocean's Seven was Stephen Redmond, Irish [13].

The North Channel

Location: channel between Ireland and Scotland, Mull of Galloway Channel
Reasons for difficulty: rough seas, cold water, storms and strong currents are one of the natural obstacles that have to be overcome during a 35 km swim.
Time of attempt: from July to September.
Threats: Considered to be the most difficult channel to cross in the world with the water temperature of about 54-57 ° F (12-14 º C); mostly cloudy days, difficulties in forecasting the weather and exact water conditions. If the sea is still, the swimmers must face a big amount of stinging jellyfish. Sharks can rarely be fund there.
Description: the channel has been attempted at least 73 times, but only 23 solo swims and 8 relay have proved successful (till 2013). The majority of the attempts ceased due to bad weather conditions and hypothermia.
Additional information: the attempts are subject to general rules established by the Irish Long Distance Swimming Association. First attempt took place in 1924 and first successful swim came in 1947.

The Cook Strait

Location: channel between New Zealand's Island: North and South
Reasons for difficulty: 16 nautical miles (26km), enormous Times in ice-cold seawater, swim among jellyfish and sharks. It is a challenge directed solely to the most skilled swimmers ready to face extreme conditions.
Time of attempt: from November to May
Threats: 1 out of 6 swimmers meets a shark, which is caused by its curiosity. Swimmers in general do not pay
attention to sharks during the crosses. There are jellyfish as
well. By the both sides the strait there are rocky shores. Cold water (14-19° C or 57-66° F) and over 26 km of tiresome swimming.
Additional information: There have been 92 successful swims so far, completed by 82 people from 10 different countries. Hypothermia and weather conditions changes are the most commons causes of failure.

The Molokai Channel (The Kaiwi Channel)

Location: Chanel between the west coast of the Molokai Island and east coast of the Oahu Island in Hawaii
Reasons for difficulty: 26 miles (42km) in deep waters of the channel (701 m) with exceptionally strong currents in the middle of the Pacific Ocean and aggressive sea life (e.g. dangerous poisonous jellyfish, sharks)
Time of attempt: all year, in favourable conditions.
Threats: big swell, strong winds, tropical heat, and very warm sea water (27° C)
Additional information: incredibly beautiful scenery, deep blue water. The channel was first swum in 1961 by Keo Nakama in 15 hours and 30 minutes. There have been 33 successful attempts so far.

The English Channel or La Manche Channel

Location: channel between Great Britain and France in the narrowest section of the Strait between Dover and Calais.
Reasons for difficulty: 34km (21 miles) of a waterway in its narrowest point, low water temperature (16-17° C), strong currents and continuously changing weather conditions.
Time of attempt: from June to September.
Threats: thousands of failed attempts caused mainly by strong currents and tides, strong winds, swells; the failures resulted most often from changing conditions and hypothermia.

Additional information: the best know channel in the world; having been completed by 1450 swimmers since the first successful attempt. The Channel is considered as role model for channel swimming. Its its rules and traditions influence open water swimming all over the world.

The Catalina Channel

Location: channel between Santa Catalina Island and Los Angeles Island, California, USA
Reasons for difficulty: cold water (especially near the shore), strong currents, potentially strong winds and the distance. The shortest distance between the shores is 34km, from Emerald Bay on Santa Catalina Island to San Pedro Peninsula.
Time of attempt: from June to September.
Threats: conditions comparable to the English Channel, mainly in terms of water conditions, difficulty and the distance. It is a physical and mental challenge for swimmer although the water temperature is slightly higher approx. 60 ° F (15.5°C). Sometimes one might meet migrating whales and pods of dolphins.
Additional information: first success in the channel swim was recorded in 1927 when Canadian George Young won 25,000 $ in Wrigley Ocean Marathon Swim covering the distance in 15 hours and 44 minutes. At the end of 2013 there had been 290 successful attempts.

The Tsugaru Channel

Location: deep channel between Japanese islands: Honshu, the main island of Japan, where Tokio lies; and Hokkaido, the northernmost of the Japanese Islands. The closest points are Tappi Misaki on Honshu and Hokkaido, Cape Shirakami.
Reasons for difficulty: international waterway, the width of 21km. Swimmers must cross a very strong current of the Japanese Sea and the Pacific Ocean; big waves and rich sea life ranging from sharks to poisonous sea snakes. English, or any other western language, are not spoken in this part of the world. The water temperature is between 62-68 ° F (16-20 ° C).
Time of attempt: from July to August.
Threats: Swimmers are pushed away to big distances as the result of significantly strong sea currents flowing from the Japanese Sea to the Pacific Ocean. At night they must face big pods of squid. Swimmers also meet patches of cold water, flown up from the depths by the screws of large tankers travelling from the Middle East up to the West Coast of the United States
Additional information: there have been 18 successful solo attempts (2014) and one double-swim.

The Strait of Gibraltar

Location: strait between Span and Morocco that connects the Atlantic Ocean and the Mediterranean Sea, the shortest distance between Punta Oliveros in Spain and Punta Cires in Morocco.
Reasons for difficulty: 18km in the eastern flow of water from the Atlantic Ocean to the Mediterranean Sea, 3 knots on average (5.5 km per hour). Heavy boat traffic, logistical barriers and the changes of the water surface constitute a challenge during each attempt.
Time of attempt: from June to October.
Reasons for difficulty: its borders were known in the ancient times as the Pillars of Hercules. The currents there are as strong as Hercules himself. Resulting from unpredictability of the weather conditions and heavy winds, there have been only 485 successful one-way solo swims.
Additional information: the majority of the swims set out from Tarifa Island due to strong currents, the distance to cover is approx. 18.5-25km [13].

THE MOST POPULAR OPEN WATER SWIMS

The record breaking achievements of swimmers are registered by official authorities responsible for sport aspects of open water swimming[2]. Among various swimming projects, the Triple Crown has gained wide recognition (114 km).

The Triple Crown of Open Water Swimming is considered as interesting swimming project as the Ocean's Seven. Its completion entails the swims of:

- The English Channel (34 km),
- The Catalina Channel (34 km),
- Manhattan Island Marathon Swim, Manhattan Island round swim (46 km) in New York [14].

The Triple Crown has been completed by over 100 swimmers and has been authorized and registered by the World Open Water Swimming Association.

Idea of the Triple Crown initiated creation of similar swimming projects for particular continents, countries and regions of the world. The foundation of the abovementioned is always the completion of two iconic bodies of water, the English Channel and the Catalina Channel. The third element of the crown is variable. As the result, there are:

- The American Triple Crown and the Tampa Bay Marathon Swim,
- The Irish Triple Crown and the North Channel,
- The Kiwi Triple Crown and the Cook Strait,
- The Southern California Triple Crown is one of the Santa Barbara Channels,
- The Northern California Triple Crown is a swim between the Farallones Islands and San Francisco,
- The Hawaiian Triple Crown is one of the Hawaiian Island Channels (e.g., Molokai Channel),
- The Japanese Triple Crown is the Tsugaru Channel,
- The African Triple Crown is the Strait of Gibraltar,
- The Australian Triple Crown is the Rottnest Channel,
- The Argentinean Triple Crown is the Maratón Internacional Hernandarias – Parana,
- The Italian Triple Crown is the Maratona del Golfo Capri-Napoli,

- The Canadian Triple Crown is the Traversée Internationale du lac St-Jean, or Lake Ontario Swim
- The South African Triple Crown is the Cape Town Swim-to-False Bay,
- The Macedonian Triple Crown is the Ohrid Lake Swimming Marathon,
- The Greek Triple Crown is the Messinian Gulf Swimming Marathon,
- The Swiss Triple Crown is the International Self-Transcendence Marathon Swim,
- The Russian Triple Crown is the St. Petersburg to Kotlin Island swim,
- The Peruvian Triple Crown is the Travesia En Aguas Abiertas Por la Ruta de Olaya,
- The Danish Triple Crown is the Beltquerung solo,
- The Croatian Triple Crown is the Faros Marathon Swim,
- The Hong Kong Triple Crown is the Clean Half Marathon Swim Solo,
- The Alaskan Triple Crown is the Pennock Island Challenge Solo,
- The Isle Triple Crown is the Isle of Jersey circumnavigation, the Isle of Man, and the Isle of Wight circumnavigation [14].

Regarding the above-mentioned, there is an opportunity to enter the World Open Water Swimming Association and enlist a Polish proposal to the Triple Crown. Therefore, we suggest entailing the Gulf of Gdańsk to the Polish Triple Crown for the swimmers who have also completed the English Channel and the Catalina Channel. In the 1960s, the Gulf of Gdańsk was an arena for swimmers from around the world to compete in ten editions of the Sea Marathon. Nowadays, the gulf witnesses rebirth of the marathon tradition. Swimmers not only participate in BCT Gdynia Marathon, but also organize solo attempts from Hel to Gdynia.

IDENTIFICATION OF HAZARDS AND ITS MITIGATION

Effectiveness of extreme swimming attempts depends on an ability to manage one's own safety. It allows minimizing the influence of negative events on action, and also limiting the occurrence of such events. The managing ability consists of four stages:

1. Hazard identification;
2. Risk analysis;
3. Planning the means of dealing with the hazard;
4. Hazard monitoring [1, 15].

The first stage aims at preparing a list of hazards of long-lasting open water swims. One must answer the following questions: What bad can happen during the swim? What are the causes of potential hazards?

Hazards are either external and objective, or internal resulting from personality and actions taken. The latter are considered significant, because they are dependent on individual predisposition of a swimmer, such as health and frame of mind at the moment of attempt, the level of self assessment and self-control, fitness and swimming experience, the level of basic knowledge connected with the challenge and effects of risk.

At the second stage, the swimmers analyze the risk resulting from the decision on swimming the particular body of water. It is described by the product of anticipated effects of action taken and probability of occurrence.

What is the probability that the anticipated hazard will occur during the swim? Am I taking the risk and swim, or not?

Risk is present, if effects of an action taken are uncertain. When estimating the risk, the benefits resulting from achievement of the pre-set goal and potential effects of failure are taken into account. By accepting positional risk, swimmers consciously make a decision to take on action. By doing so, they expect to be successful and complete the swim in a particular body of water. When the goal is achieved, the risk may be considered rewarding. Yet, by taking the risk, swimmers must also take into account failure and all sort of life and health threatening consequences.

The third stage of risk management constitutes a resultative of actions taken in the previous phases. It is required to prepare various alternative procedures towards potential hazards that may occur during swim attempt.

Can we avoid hazard or mitigate its effects?

What are the ways to minimize risk? At what cost?

What to do on the event anticipated hazard factors?

At the fourth stage, what is controlled is the level of safety of the swim. Are there any shifts in the level of risk?

Are there any new symptoms of a hazardous event? Does the continuation of the swim increase the level of risk?

The safety management may constitute the following strategies:

Risk taking

Consent to take risk must result from awareness of the existing hazards. It cannot be considered as accidental – *It might work*. Action without proper analysis departs from safety management. The consequences of acceptance of risk are contingency plans.

Contingency plans

Contingency plans are prepared in case of presence of an anticipated hazard. They are an elaborated sequence of actions taken by a swimmer in a hazardous situation. Contingency plans allow them to reduce negative effects of the event. The most important contingency plans for extreme swims are rescue and self-rescue procedures.

Risk compensation
This strategy mitigates hazards by making up for one's deficiencies and application of safety measures (silicone masks, lubricants, lanolin), and rescue actions. Neoprene swimsuits, silicone masks, or even fins constitute a specific compensation (if permitted by the authorities observing).

Transfer of risk
Transfer means relocation of risk to a supporting team. In 1875 Webb was escorted by three boats, an American, Nyad, had 45 technicians accompanying her in 2013. The support comprised of experienced lifeguards, sailors, divers, a doctor, and technical staff. Every 30 minutes, the escort team provided her with electrolytes and nutrition. They were responsible for her safety and navigation.
The relocation of part of liability and noticeable effects of the hazards to insurance company, displays traits of a transfer.

Risk avoidance
Risk avoidance might not be identified as refraining from any action. It would be pointless, as the aim of the action are coverage of a given distance and achievement of desired satisfaction.
Thus, avoidance is described as reduction of unnecessary recklessness or underestimation of hazards. It is considered the best anti-hazard protection [1].
In rare cases, this strategy may result in abandoning the swim or establishing a new date of the attempt.

DROWNING

The essence of all life threatening hazards present in water is drowning. The direct cause of death is water in the airways. Drowning poses a threat to people bathing and swimming in open waters. It also concerns swimmers that are involved in extreme challenges.

Appropriate safety measures: basic safety measures are escort boats, and experienced and competent team. Internal risks are mitigated by appropriately planned and executed adaptation training. Logistics and equipment preparation are considered necessary as well. They are described in the following risk characteristics.

NAVIGATION IN WATER

What is crucial for long distance swimming is staying on course, as there is a lack of points of reference that may be found in the pools (marking of lanes). Furthermore, the swim time often exceeds 24 hours, which forces the swimmers to continue in dark at night.

The story of tragic Leander's love to Hero took place in Ancient Greece. Each night, in secrecy, Leander swam to his beloved woman across the Dardanelles (approx.7km). At dawn, he came back. Hero used to light a lamp in her window in order to guide him. One night, when the light was blown out by the wind, Leander, having lost his way, drowned in the sea. When Hero saw his dead body, she took her life [5].

Appropriate safety measures: illuminated escort boat, LED tape and fluorescent tape, flares, chemical light, flashing light fixed to the goggles strap.

WATER DYNAMICS

In open waters, water dynamics shall be taken into account. Swell and strong sea currents hinder the swimmer's attempts to stay on course. What is more, they often prevent them from reaching the shore. It forces swimmers to apply increased efforts and cover significantly longer distances. The ones completing the English Channel (34km) exceed the shortest way by extra 20 -50 km. Webb swam 64 km, Zarzeczańska 42 km, and Ogrodnik 78 km [6, 9].

Some of locations pose a threat of water swirls, as
Captain Webb perished in the Whirlpool Rapids below Niagara Falls.

Appropriate safety measures: practical choice of place of departure determines the place of arrival; relevant choice of season and time of day, escort from thoroughly prepared boats and kayaks, and also an experienced support team familiar with particular water (it is assumed to assign one swimmer to one boat, in extreme crosses one swimmer-two boats).

LENGTH OF DISTANCE AND FATIGUE

The longest swimming distances amount to over 100 km. Diana Nyad, American, swimming from Cuba to Florida, covered 170 km in 53 hours [12].

Appropriate safety measures: hydration every 20-30 minutes, supplementation of carbohydrates – preferably liquid; optimal pace accustomed to the level of fitness and water temperature (56-64 strokes per minute in crawl). Team and swimmer's experience, training, observation, agreed signals.

WATER TEMPERATURE AND HYPOTHERIA

Low water temperature poses a serious threat for swimmers. The southern seas, where water temperature reaches 30°C, are an exception. To long exposure to cold water causes illness followed by: noticeable cold, chills, goose pimples, consequently - impaired consciousness, hallucinations, sleepiness, cardio-respiratory arrest. Webb protected himself by application of porpoise grease; today swimmers use lanolin.

Lynne Cox, one of the most well-know American swimmers, is recognized for her unique abilities to withstand cold water conditions. During the Strait of Magellan swim (1976), she stayed in cold water, about 5.5ºC, for more than an hour! Cox's another memorable achievement was 25 minute swim in the Antarctic in water close to 0°C in 2004. In 1987 she became famous for her crossing the almost four kilometre body of water between two islands in Alaska, Little Diomede and Big Diomede in the Bering Strait. The swim had a political aspect, as Cox crossed the border between the USA and USRR (first time for 48 years) [16, 17, 18].

Appropriate safety measures: Cold water training, lanolin (sheep grease and Vaseline)[3], creams, neoprene (if permitted), ginger, wide swimming mask, swimming cap (according to rules and regulations), earplugs. Swim must be immediately ceased in extreme cases of hypothermia. Swimmer should leave water, dry, dress warm clothes and cover.

The decision is taken by the escort team, because the swimmer is not able to act consciously.

WATER SALINITY

Long-distance swimming in seawater exposes swimmers to very high levels of salinity. It varies depending on the body of water. The highest salinity is in the Red (37-42‰), relatively low in the Baltic Sea (approx.7,8‰). Water salinity in seas and oceans increases as the result of high evaporation, and decreases in the subarctic area (25‰). Swimming in water reach in salt causes irritation of eyes, mucosa, skin and stomach.

Appropriate safety measures: Lanolin, swimming goggles, swimming technique that allows to avoid seawater swallowing, seawater training.

MARINE TRAFFIC

In many reservoirs, especially in straits and narrow sections, swimmers often cross water where high intensiveness of marine traffic is present. The threat of collision is very serious, as the big ships have limited manoeuvring options and are unable to change the course easily. Moreover, it is difficult for captains to spot a swimmer.

Appropriate safety measures: Permission issued by a competent Maritime Office, coordination between the escort boat and port authorities, radio contact between escort boats and other ships.

MARINE LIFE

Those of the biggest hazards in open water are, obviously, sharks. They are most commonly found in the Straits of Florida. The first person to cross this strait with effective anti-shark means was Diana Nyad, who in 2013, at the age of 64, successfully reached Florida shore. It was her fifth attempt. In 1978 she was forced to abandon the swim due to worsening weather conditions, although she had already covered a distance of 122km [11, 12].

What is the Straits of Florida also famous for, is deadly jellyfish. They painfully sting the human skin. They mostly take its toll at night as the appear near the surface. Diana Nyad was forced to stop one of her early attempts from Cuba to Florida due to heavy jellyfish stings [5, 12].

Appropriate safety measures: escort team that has a rich knowledge of local marine life and their habits, technical deterrents, such as Australian Shark Shield, specialized trainings, e.g. Advanced Shark Awareness Diver with Professor Vic Peddenorsa from the University of Durban (RSA).

CHAFING AND EXCORIATION OF SKIN

Long-distance swimming entails performance of millions of stroke cycles. In each cycle, repeated moves cause chafing of limbs against skin of the trunk. Not only may it cause excoriation, but also may lead to serious injuries, especially when swimming in seawater.

Appropriate safety measures: Lanolin, creams, swimming technique, bilateral breathing that reduces chafing.

In the light of the above-mentioned risks and safety measures, Bogusław Ogrodnik drew up an instruction for escort team while preparing for the English Channel swim in 2014 [6].

ASSUMPTIONS OF THE ENGLISH CHANNEL SWIM 2014

Aim: to complete the swim, preferably in 17 hours but 20 will still be considered not bad,
Threats: seasickness (I have a drug called Lokomotiva), hypothermia (I have ginger), injury (I have Ketonal),
Pace: my average pace fluctuates between 45-55 SPM (strokes per minute)
Breathing: I breathe both sides, but I would prefer if the center of the escort boat was on my left at the distance of 10-20 m,
Drinking: From the start I want to drink every 30 min. Vitargo Electrolite at the beginning and perhaps hot tea with ginger, after 4 hours Vitargo Profesional and tea in turns,
Eating: every hour, at the beginning Tablerone, then bananas and Vitargo gel in bags,
Strategy: I plan to keep a steady pace, but after 5 hours I plan to take the first Ketonal pill and then one pill every 5 hours,
Emergency: If I ask to cease swimming, I want you to give me a chance to think it over, unless it concerns dangerous animals,
Communication: I would like you to write covered distance and time on the board I have and show them to me during the eating breaks,
Other: I would like you to take a photo of me with a Polish national flag and the flag of Wrocław that are intended to be auctioned during an annual charity ball organized by the President of Wrocław" [6].

SUMMARY

The fact that there is a huge number of various swimming endeavours in the field of open water swimming, proves a growing popularity of this form of challenge among swimmers.

The projects compose of swims located almost in every part of the globe. It must be highlighted that high level of difficulty of the swim has also a major influence on the attractiveness of particular bodies of water. They are adequate to the hazard levels, e.g. long distance, low water temperature, animal attacks, etc.

The fundamental problems that open water swimmers must solve are risk assessment, hazards detection and development of risk management strategies. It can be stated, with high probability, that despite extreme challenges, swimmers do not take excessive risks that cross boundaries of their life safety.
It requires an exceptional level of responsibility for one's actions. Sportsmen are very well prepared, physically and logistically, and authorities that coordinate attempts perform relevant selection procedures for the heroes-to-be.

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[1] The term 'sportsmen' in this study is referred to all people actively engaged in physical activities, recreational, touristic, and professional sport as well. The problem of the safety precautions is related to all forms of activity.

[2] Open Water Swimming FINA, World Open Water Swimming Association, The Channel Swimming Association, Channel Swimming & Piloting Federation, Irish Long Distance Swimming Association, Water World Swim, Catalina Channel Swimming Federation, NYC Swim, Cape Long Distance Swimming Association, Asociación de Cruce a Nado del Estrecho de Gibraltar.

[3] Lanolin is a wax secreted by the sebaceous glands of wool-bearing animals. It is composed of sterol esters (inter alia cholesterol). Refined and anhydrous lanoline is odor-free (Lanolinum anhydricum), whereas, hydrous lanolin (Lanolinum hydricum) contains 25-28% of water.

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