A False Bay Surfskier's Take on Technology and Safety

2025

Safety isn't just your choice; it's also the heartfelt wish of those who love you.

Thank you to Pablo Nart for his work on this document.

Contents

This document covers: general safety principles (p. 1); a **first Section on safety gear**, which includes an overview of safety systems and transmission modes (p. 2), followed by two tables on their fit for individual needs and range (p.4), and an analysis of key safety devices: SafeTrx (p. 5), Personal Locator Beacon or PLBs (p. 6), VHF radio (p. 8), Man Overboard or MOBs (p. 9), and signalling devices (flares, whistle, mirror) (p. 10); a summary table (p. 12). **The second section covers the usage context of this gear**, including NSRI rescue procedures (p. 13) and hypothermia (p. 14). It ends with local safety services, a glossary, emergency numbers, SafeTrx details (p. 16) and a user's evaluation table (p.17).

Eight key concepts: alert promptly; cold water survival; NSRI mode of action and capabilities; device range; continuous tracking for homing; final contact visibility tools; avoid reliance on a single device; budget and intended use.

Three principles:

- The **call** for help should be initiated **promptly** in any distress situation to avoid fatigue, prevent **hypothermia**—accounting for the time a rescue vessel may take to arrive—and enhance location accuracy.

- A robust safety strategy with **multiple layers** or backups is essential for effectively managing risks and providing individuals with a sense of control in challenging situations; therefore, a minimum of two devices for each rescue phase (alerting and homing) is recommended.

- **Familiarity with** the functioning and requirements of safety **devices** is crucial for effective call and response and enhances personal safety.

Overview: devices and transmission modes

For paddlers, several key devices can be critical in ensuring a rapid response and helping rescuers home in on the caller during emergencies. The main categories are:

SafeTrx is a free mobile app that, in its national version (there are various SafeTRX apps for specific countries as per their own app store), links directly to the emergency operations centre (NSRI EOC & SA Maritime Rescue Coordination Centre (MRCC). Should this app be used overseas from where it's licenced, it will link to that specific home MRCC, which should contact the local MRCC to investigate). It provides real-time alerts and tracking features and supports voice and photo sharing. The app relies on mobile phone coverage to operate, which can be patchy and depends on the device's GPS connectivity and own battery life to be effective.

Personal Locator Beacons (PLBs) provide immediate worldwide alert and continuous location tracking in distress situations. They rely on two different signals and transmission modes.

- The **primary UHT 406 MHz** signal offers practical worldwide coverage with guaranteed signal reception, as it sends the initial alarm and position tracking data via satellite. However, it is typically subject to 5–10-minute delays.

- The **secondary VHF 121.5 MHz** signal is used for real-time homing and is displayed on the radar screen of some rescue aircraft and vessels equipped with this. However, it is limited by line of sight, meaning big swell, obstacles and features such as hills or coastal inlets obstruct it).

Man Overboard (MOB) devices send instant VHF distress signals via AIS, providing continuous location coordinates to nearby rescue stations and equipped vessels. They are also limited by line of sight.

VHF radios enable direct voice communication with other vessels and rescue services, offering a similar range as MOBs. When equipped with **Digital Selective Calling (DSC) (which only works if the radio is licensed with ICASA with a registered MMSI number)**, they send a distress signal with coordinates but acknowledge they do not provide further position updates. Their signal is also dependent on line of sight.

Traditional safety tools, such as **electric flares, red flares, strobe lights, and whistles**, improve visibility and help rescuers locate the caller. In some cases, they can also act as alert triggers for nearby vessels or people on the coast.

In summary, the devices rely on various transmission systems. **PLBs use the COSPAS-SARSAT system** for their UHF 406 MHz signal, **a practically universal** satellite network sanctioned by state institutions, the UN and Coastguards. This system is used worldwide by recreational sailors and for the merchant and fishing fleets. **VHF signals,** including **radios, 121.5 MHz PLBs signals, DSC** and **AIS** (commonly used by MOBs), enable communication and distress alerts within a **limited range and are subject to line-of-sight. It must be noted that fewer and fewer craft are equipped with RDF technology, so this 121 Mhz is becoming obsolete in general. Also, modern EPIRBs / PLBs update the 406 MHZ virtually continuously, so the "homing" signal isn't as necessary as it was for the original older versions, which merely gave an indication of approximate location on activation only.**

AIS MOB device signals can increasingly be picked up by Satellite AIS receivers (as satellite constellations and signal technology grow) and possibly displayed by websites such as Marine Traffic. Emerging tech such as Starlink direct-to-satellite connectivity will also eliminate the requirement for a modern phone to be connected to terrestrial towers, thus enabling SafeTRX to work "anywhere," subject to device constraints.

Modes of Transmission: **PLBs** typically connect through their **406 MHz signal** via Satellite to local state-sanctioned control centres (Maritime Rescue Coordination Centres or MRCCs), which then relay the distress signal to the coastguard (also referred to as RCCs or, in the case of South Africa, the NSRI EOC). If they are within range, rescue stations or nearby vessels can detect VHF signals directly. **SafeTrx** works over cell phone **data reception**. It transmits data directly to the Maritime Rescue Coordination Centre when registered locally. At the same time, international versions send alarms and tracking information to the MRCC in the country of registration, which then contacts the relevant country's MRCC to trigger rescue action.

When choosing and using safety devices, consider signal coverage, ranges, and areas of limited reception or "dead zones."

This section follows a summary table of the main characteristics of the different groups, along with a more detailed analysis of each device group's pros and cons.

Which tech is best for my paddling needs?

	Alerting technologies					Homing technologies					
	SafeTrx	VHF Radio DSC	MOB / AIS	PLB 406 MHz Cospas-Sarsat	Flare , Mirror, Whistle	SafeTrx	VHF voice	MOB / AIS	PLB 121.5 MHz homing signal	PLB 406 MHz Cospas-Sarsat	Flare , Mirror, Whistel
Inshore – rescue station nearby or many ship with receptors present or coastal watchers	🟢	🟢	🟢	🟢	🟡	🟢	🟡	🟢	🟢	🟡	🟢
Inshore – quiet location	🟢	🔴	🔴	🟢	🔴	🔴	🔴	🔴	🟢	🟡	🟢
Offshore	🔴	🔴	🔴	🟢	🔴	🔴	🟡	🟡	🟢	🟡	🟢
Rescue helicopter / aircraft	🔴	🔴	🔴	🟢	🔴	🔴	🔴	🟢	🟢	🟢	🟢
Range dependent and affected by topography	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y

Both device tables are adapted from Personal Emergency Radio Devices, Maritime & Coastguard Agency, UK, no. 255. The author added SafeTrx and Flare, Mirror, and Whistle columns.

•To be considered •Possible •Likely not suitable

Signal Range and Reception Comparison by Groups

	Range		Alerts		
	Signal Range Near-Universal	Signal Range Limited to Miles & Obstructed by Topography	Instant notification for Nearby Vessels	Instant Notification for Nearby Rescue Station and Coastal Onlookers	Instant Notification for Coastal Onlookers
PLBs with AIS	Y	N	Y	Y	N
PLB without AIS	Y	N	Y	Y	N
SafeTrx, MOB, VHF DSC radio	N	Y	Y	Y	N
Whistle, Mirror, Flare	N	Y	Y	Y	Y

•To be considered •Likely not suitable

While helpful for providing an at-a-glance overview of complex issues, traffic light and binary tables lack the precision and granularity required for thorough analysis and explanation. For more details, see the following section:

ALERTING (distress call) & HOMING (caller location) SYSTEMS

SAFETRX APP	FREE
STRENGTHS	LIMITATIONS
Cost-free: The device is free to use, and since everyone has a cellphone, it is easily accessible. **Immediate Alert and Position Updates:** • South African Registered Device: Sends an immediate distress alert and regular position updates (30-second tracking packets sent every five minutes) to the NSRI Emergency Operation Centre - NSRI EOC via mobile data. Then, the NSRI alerts their nearest rescue station, typically via message and phone. This process streamlines the call by bypassing the South African Maritime Safety Authority (SAMSA) MRCC-dependent centre, which is dedicated to receiving satellite signals from foreign versions of SafeTrx and all PLBs (Personal Locator Beacons). • Non-register in South Africa device: relays similar data on alert and position via phone lines to the user's registered	**Not Operational During Load Shedding** **Depends on Phone Signal.** On Miller's Run, the signal is patchy, particularly between Roman Rock Lighthouse and Miller's Point. At Smitswinkel Bay, there is zero data connection. The same limitations apply to other coastal areas worldwide. **Can be Difficult to Use in Challenging Conditions:** • Hard to operate the phone while in moving water or with cold hands. • Needs to be held out of the water or attached high on a PFD. • Water layer or droplets prevents touch sensitivity. **Battery Life/Charge:** Limited battery life, requiring careful management of charge. **Limited Range:** The device has a limited operational range, typically only effective within a few kilometres of shore.

country MRCC via satellite, which in turn contacts the concerned MRCC in the country where the distress call is being triggered, before continuing to the NSRI EOC station adding a minute delay. **Voice and Photographic Communication Available:** • Emergency services call back to the device, allowing for voice contact with the rescue station. • Additionally, users can make a phone call to the dedicated NSRI rescue contact number in South Africa 087 094 9774; or if no phone credit 112 opt 4 is a free call) for communication with the rescue team. • Photographic communication can provide more context. **Trip Logging and Alerts:** The App enables users to log their trip, track progress. Additionally sends alerts to selected contacts if the trip deviates from the planned route or if the user fails to check in at specified times. **Registration:** • The device requires registration with the app, ensuring a formal link to official rescue resources. • It also allows for the identification of the caller and their registered relatives during emergencies.	**Not Part of GMDSS:** The device is not integrated into the UN's Global Maritime Distress and Safety System (GMDSS), though it is a recommended supplement. **App Installation for Foreign Users:** • For iPhone users, installing the South African SafeTrx app can be difficult due to the need for a local credit card to access the local app store (even though the app itself is free, the store requires credit card "readiness") • App Free for Android users via the play store. • In this scenario, there is an additional step compared to a PLB, which directly alerts the relevant country (see section below). This adds a brief minute delay, as the signal must first be transmitted via the mobile network to the MRCC in the country of registration, which then contacts the relevant country's MRCC to trigger action. This whole process typically delays the information by 5-10 minutes. NSRI SafeTrx Sea Rescue

Additional comments:

– Best and easiest for inshore activities.

– Handy but not as reliable as other marine-certified devices.

PERSONAL LOCATOR BEACONS (PLB)

STRENGTHS	LIMITATIONS
Global Range: • Works worldwide, other than polar regions, both on land and at sea, as long as there is a clear view of the sky, making it usable in almost any environment. • In some areas (depicted in dark blue on the map below), there may be longer delays in signal transmission until the satellite moves into the lighter blue areas, where it will be	**Minute Information Delay:** There can be a few-minute delay in relaying information between reception (MRCC) and rescue stations (RCC) compared with a VHF or phone voice call. **Positioning Requirement:** The device must be kept out of the water—either by holding it above the surface with your hand if in the water, or by attaching it high on your

tracked again.

Simple to Use: is extremely easy to operate—just press a button and keep it above water level, ensuring minimal user error in emergencies.

Precise Alert and Homing Location via GPS and two radio signals:

- **406 MHz Alert Signal:** Sends periodic 30" to 2' GPS signals via COSPAS-SARSAT-LUT system together with precise GNSS/GPS location coordinates to the national MRCC, giving Search and Rescue authorities an accurate starting point for their search. (GPS soon no longer necessary as the more precise MEOSAR, backward compatible system, is rolled out).
- **121.5 MHz Homing Signal:**

  – It allows rescue teams to lock onto the signal in real time, reducing delays caused by the 406 MHz satellite signal bounce and routing through control centres. The signal provides directional information, not precise location, which is provided by the GPS/406 MHz signal.

  – It is one of the International Air Distress (IAD) frequencies and is used by rescue aircraft, all of which are equipped with mandatory radio direction finders (RDFs) to home in. Commercial aircraft can also detect it when overhead and report to their control centres.

Although not part of the Global Maritime Distress and Safety System, PLBs operate, and are subject to similar stringent product conformity regulations as EPIRBs (see additional comments below). Unlike EPIRBs, however, PLBs must be manually activated.

Battery Life: 5 years and 24 hours of use

Registration:

- The device requires registration with the MRCC, ensuring a formal link to official rescue resources.

- It also allows for the identification of the personal flotation device (PFD)—while ensuring the antenna is pointing upwards for optimal signal reception.

Limited 121.5 MHz Homing Detection due to line of sight limitations:
Nevertheless, location is not completely impaired. The GPS coordinates, though slightly delayed, remain precise and are transmitted every few minutes via the 406 MHz signal to the satellite system, which relays them simultaneously to both the MRCCs in the country where the alarm originated and the registration country, thus providing a reliable basis for homing onto the caller.

No voice communication

https://cospas-sarsat.int/en/system/detailed-leosar-geosar-system-description/leosar-satellite-coverage

caller and their registered relatives during emergencies.

If the device is not registered, the emergency signal is essentially ignored by MRCC's due to the high number of false activations.

Dual MRCC Coordination for Foreign Waters:

- When the distress signal occurs in foreign waters, the COSPAS-SARSAT system sends alerts, typically at 90-second intervals, simultaneously to both the country of registration and the MRCC of the country where the signal is triggered.
- In this situation, the MRCC of the country of registration typically provides additional information, usually via message and phone, such as the owner and vessel's identity. This complements and verifies the initial distress signal from COSPAS-SARSAT, which has already been automatically received by the MRCC of the foreign country where the alert originated.

Popular Models with Enhanced Features:

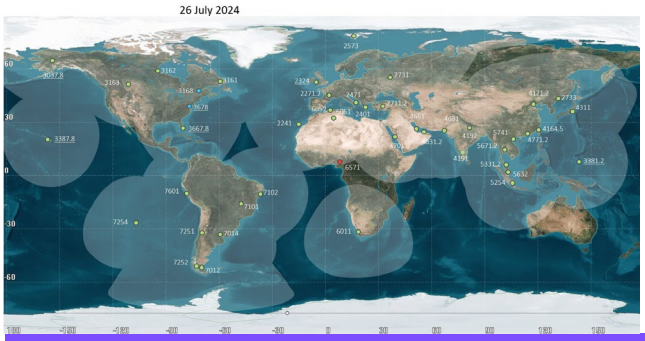
- Popular models like the Ocean Signal RescueME PLB1 and ACR ResQLink beacons feature both 406 MHz alert signals carrying GPS positioning data and 121.5 MHz homing signals.
- Importantly, higher-end models like the ACR ResQLink AIS and Ocean Signal PLB3 also include Automatic Identification System (AIS) technology (also known as "man overboard" MOB, see section below), enhancing alert and homing capabilities by alerting nearby vessels and rescue centre's equipped with AIS transponders.

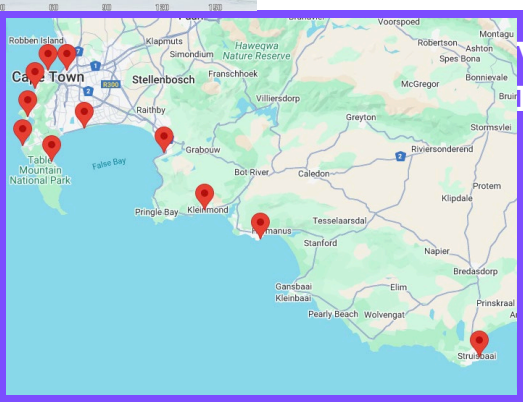
Additional comments:

– Ideal back up device

– Choice for personal watercrafts

– It is a personal EPIRB (the current gold standard for ships).





VERY HIGH FREQUENCY RADIO (VHF)

STRENGTHS	LIMITATIONS
Immediate Alert via • Voice Communication: The system allows for real-time alerts and homing via voice communication with the rescue station and nearby vessels. It excels in group coordination, whether for rescue operations with nearby vessels or for team sports. • Digital Selective Calling, DSC (if installed): emits an audible alert signal to nearby rescue stations and nearby vessels with compatible receptors, within range. Many newer VHF radios with DSC have a built-in GPS receiver that allows the radio to transmit the caller's position (latitude and longitude) along with the distress signal. **Immediate Multiple Alert Transmission:** The voice call/DSC signal alert is sent instantly via an VHF radio to all nearby rescue station aerials and vessels equipped with VHF radios and DSC, using specific band frequencies. **GMDSS Complaint and Recognized:** The system is recognized by the Global Maritime Distress and Safety System (GMDSS) ensuring a formal link to official rescue resources.	**Limited Alert Range:** Effective alert range is limited to line of sight, which is dependent on antenna's height. "A few miles" according to the UK Coastguard for a person in the water (MCA/255). **Signal Coverage Gaps:** No signal in areas without a nearby ship or rescue station aerial (see map below). No signal in Smitswinkel bay and blind spots around Miller's Point. No field strength studies. **DSC not suitable for homing** as it emits a single GPS position and stops once acknowledged. (Vessels / aircraft equipped with RDF can track the direction of signal transmitted from the VHF) **Obstacles Impact Signal:** Mountains, cliffs, enclosed coastal areas, and tall waves can obstruct voice signals. **Potential Signal Interruption:** Voice signals may occasionally be broken or unclear. **Can Be Affected by Extreme Conditions:** VHF signals may be disrupted in severe weather conditions, such as rough seas, strong winds, fog, and heavy precipitation (U.S. National Oceanic and Atmospheric Administration, NOAA; manufacturers' manuals).

ICASA Registration: • The device requires registration with the ICASA,. 	Requires **Certification:** A Certificate of Competence is necessary for operation. **Size and Weight:** The device is relatively large and heavy compared to other devices. **High Battery Consumption with DSC:** its function drains the battery quickly. **Operator-Based Licensing:** If the VHF radio doesn't have DSC, the license is issued to the operator rather than the individual radio. **Older or Simpler SECs Without GPS:** may only provide audible or radar signals for directional information.
Additional comments: – Best for voice communication.	

HOMING DEVICES (OR MAN OVER BOARD, MOB)

STRENGTHS	LIMITATIONS
Immediate and Multiple Alert Transmission: The alert is sent instantly via specific VHF radio frequencies to all nearby vessels or rescue station aerials, equipped to receive it). **Real-Time GPS Homing Data:** The precise GPS based location of the person overboard is transmitted at regular intervals to rescue stations & vessels, equipped with detectors, in the vicinity, enabling rapid and accurate homing. **More accurate than a standard (older) PLB**, the AIS equipped MOB reduces location estimate accuracy from 100 meters to just 10 meters, according to some manufacturers. **Mid-Range Cost with Strong Capabilities:**	**Limited Alert Range:** Effective alert range is limited to line of sight, which is dependent on antennas height. "A few miles" according to the UK Coastguard for a person in the water (MCA/255). **Signal Coverage Gaps:** No signal in areas without a nearby ship or rescue station aerial (see map below). No field strength studies. **Obstacles Impact Signal:** Mountains, cliffs, enclosed coastal areas, and tall waves can obstruct signals. **Positioning Requirement:** The device needs to be kept out of the water or attached high on a personal flotation device (PFD). **Unintended Activation:** Some devices may activate automatically upon contact with

Equipped with GPS, these devices offer robust Digital Emergency Communication (DEC) and/or Automatic Identification System (AIS) homing capabilities, with ranges of 5-8 nautical miles (e.g., MOB1, ONWA AIS). **Simple to Use** **GMDSS Compliant and Recognized:** by the Global Maritime Distress and Safety System (GMDSS) ensuring a link to official rescue resources.	water, potentially triggering unintentionally while paddling. **No registration, voice communication or air rescue capabilities.**  
Additional comments: – Can complement other alert systems	

FLARES AND MIRRORS

STRENGTHS	LIMITATIONS
Electric flare: The EDF1 from Ocean Signal emits a flashing Morse signal for 6 hours, boasting a long lifespan and high visibility (up to 7 miles). It is visible from boats and helicopters and made a strong impression on the NSRI crew at the Simon Town station. Battery life 7 years. **Strobe light:** lighter than an electric flare, but with shorter lifespan and visibility **Red handheld flare:** should be set off in view of the rescue craft to facilitate homing or as an alert when in sight of the coast. It burns very bright, visible day and night. Not expensive. **Mirror:** works in high luminosity **Whistle:** a practical call device for rescue boat and fellow paddlers. Present by default in most life jackets. A lot of bang for the money.	**Electric flare:** range limited in days of full sun. **Strobe light:** range limited in days of full sun. **Red handle flare:** 60 seconds lifespan. Not accepted on flights without prior approval **Mirror:** requires full sun to be effective. **Whistle:** limited range to 0.5 km at most in noisy conditions   
Additional comments: – Not GMDSS recognized. – In very specific circumstances, can be used as alert devices. – While all have major limitations, they can be excellent complementary tools. – Low cost. – Other flares (parachute and orange) characteristics can be consulted at https://www.maritimenz.govt.nz/recreational/safety/communications/distress-flares/	

SATELLITE EMERGENCY NOTIFICATION DEVICES (SENDS)	
CHARACTERISTICS	LIMITATIONS
Portable emergency notification and locating devices which uses commercial satellite systems rather than the COSPAS-SARSAT constellation.	**Not GMDSS recognized:** Commercial systems, not yet fully integrated in standard Search and Rescue systems
– More here: https://en.wikipedia.org/wiki/Satellite_emergency_notification_device	

Importantly:

All personal emergency devices only function when their aerial remains above the water.

Always use the holder designed for attachment to your PFD or if not, keep the unit –and consistently– above the water level (the device also needs to receive GPS data before it can emit information).

What can tech offer me?

	SafeTrx	PLB		VHF radio	Man Overboard	Whistle / Flare
Transmission type / frequency	Mobile network. Local version directly to NSRI. Foreign version directly to MRCC on country of registration	406 MHz Satellite Alert and GPS Continuous Position signal on modern versions	121.5 MHz Only Continuous Directional Homing Signal	DSC 156 MHz and up to 162 MHz for radio channels	AIS 156 MHz with GPS Continuous Position Signal	
What range does it have?	• Coverage variable as it depends on phone signal. • 4G up to 30 Km, 5G up to 10 Km	Worldwide	• Line of sight, with no physical obstacles (waves, mountains, ships, etc.). • Up to 185 km for aircraft flying at higher altitudes. • Up to 37-93 km at lower altitudes or for maritime distress signals. • 8 Km if in waves.	• Line of sight, with no physical obstacles (waves, mountains, ships, etc.). • 8 Km if in waves. • Affected by foul weather. • Some coastal areas may lack coverage.	• Line of sight, with no physical obstacles (waves, mountains, ships, etc.). • 8 Km if in waves. • Affected by foul weather. • Some coastal areas may lack coverage.	0.5-2 km range / up to 10 km or more depending on type
Does it raise an audible alarm?	Yes, with NSRI (EOC)	Yes, with MRCC	• Rarely • Yes, in passing aircrafts.	Yes, on vessels with DSC receivers in range, including Coastal stations	Yes, on vessels with AIS receivers in range, including Coastal stations	Yes / Yes, visual
Does it help rescuers find me once they are within the last mile?	• National version sends regular GPS position directly to the NSRI without delay. • Foreign version sends regular GPS position with a 5–10-minute delay.	• Yes, rescue helicopters can use DF to locate the casualty in real-time. • Yes, but there is a 5–10-minute delay for the latitude and longitude coordinates to reach the rescue vessel.	• Yes, direction finding on a continuous signal. • Real-time homing for (all-weather, hard cabin) vessels. • Detected by aircrafts • Receptors not used on vessels for operations within 2 km of shore.	No, initial GNSS position only and then stops once acknowledged.	Yes, regularly updates GPS position.	Yes, particularly in the last mile and in extremely foul weather or low visibility
Can other vessels detect it?	No	No	Rarely	Most but not all carry DSC receivers	Many carry AIS receivers	Yes
Reaction time	• Usually, 15-20 minutes to assemble and launch, depending on the station.	• 5-10 minutes for the signal to reach the local station. • Usually, 15-20 minutes to assemble and launch, depending on the station.		• Usually, 15-20 minutes to assemble and launch, depending on the station. • Can alert nearby vessels	• Usually, 15-20 minutes to assemble and launch, depending on the station. • Can alert nearby vessels	• Usually, 15-20 minutes to assemble and launch, depending on the station. • Can alert nearby vessels

Exploring NSRI Rescue Operations at Sea and The Role of Local Coast Watchers

Understanding the different rescue operations and the technology behind them is crucial for both safety at sea and effective emergency responses. In our local waters, rescue operations are tailored to the situation at hand and depend largely on the type of vessel involved, proximity to the shore, and support from local volunteer groups.

A distress call can be made through various means (PLBs, VHF/DSC, MOBs, etc., see the Technology Review section). These technologies provide rescuers with GPS coordinates and directional tracking capabilities, which are utilised differently depending on the type of vessel involved and the distance from the coast. Here's an overview of how rescues are typically carried out in South Africa.

Rescue Operations Based on Vessel Type

a) Large Vessel Rescue: When a large vessel is deployed for a rescue, it is equipped with advanced technology to help locate and communicate with those in distress. Most notably, these vessels are fitted with radar and directional finding systems capable of picking up AIS and DSC signals (used in Man Overboard devices, as well as some VHF radios) to locate and track the caller.

b) Small Vessel Rescue (Within 2 km from Shore): When the rescue is closer to shore (within 2 km), a small vessel is often dispatched. These vessels typically do not have the sophisticated tracking systems found on larger vessels. Instead, their search relies on visual spotting, GPS coordinates from the distress call (often plotted on a phone), mobile and VHF radio communication with their base and visual information from the mobile party of NSRI rescuers on the coast, including the local volunteers of the reliable NSRI Coast Watchers Group.

The Role of Local Coast Watchers

Our region has a unique and invaluable resource that significantly enhances our safety: the NSRI Coast Watchers Group. This dedicated group of volunteer spotters plays a crucial role in supporting rescue operations. The Coast Watchers are alerted by the local rescue station whenever a distress call is made. They are trained to visually locate and track the distressed vessel or individual using binoculars, even when other technological resources (such as radar) are unavailable. Their eyes-on-the-ground support is critical in guiding rescue crews to the scene. The Coast Watchers' ability to visually track distress situations provides invaluable assistance in locating those needing help.

Why This Matters

In long-distance and, critically, short-distance rescues, being equipped with visual tools like flares (electric or red) or a mirror plays a key role in helping rescuers on the coast and local volunteer Coast Watchers locate and track the caller. This is especially important when electronic tracking systems are not used by small rescue vessels close to shore and in offshore and challenging conditions, where these tools provide valuable additional final-meter accuracy to complement the signals emitted by our electronic devices.

Hypothermia

Hypothermia occurs when the body's core temperature falls below 35°C and is a medical emergency. As people age, their ability to tolerate cold and generate heat decreases, making older adults much more vulnerable.

When paddling, dress more for the temperature of the water than the air, and always account for the time a rescue vessel may take to arrive, as both factors are critical in preventing hypothermia and ensuring your safety in the event of an emergency.

Table 1. Cooling effects of immersion in cold water.

Water Temperature °C / °F	Loss of Dexterity without protective clothing	Exhausted or Unconscious (drowning without flotation)	Maximum swimming time for self-rescue	Likely Survival Time (with flotation)	Maximum Survival Time (with flotation and protective gear)
0.3 / 32.5	<2 min	<15 min.	Nil	<15-45 min	1.4 hrs
0.3 to 4.5 / 32.5 - 40	<3 min	15-30 min	0-7 min	2-3 hrs	1.5-5 hrs
4.5 to 10 / 40 - 50	<5 min	30-60 min	7-40 min	2-3 hrs	5-12 hrs
10 to 15.5 / 50 - 60	10-15 min	1-2 h	40-75 min	3-5 hrs	12-22 hrs
15.5 to 21 / 60 - 70	30-40 min	2-7 h	75-105 min	4-17 hrs	22-36 hrs
21 to 26.5 / 70 - 80	2 h	7-12 h	105-140 min	>17 hrs	36-54 hrs
>26.5 / >80	2-12 h	>12 h	>140 min	>17 hrs	>54 hrs

Table 2. Stages of Hypothermia

Prioritize water temperature when dressing, not the air

Stages of Hypothermia :

Body core temperature*							
°C	°F	Shivering?	Impaired physical ability?	Altered mental state?	Unconscious?	Losing signs of life?	Status
37	98.6	No	No	No	No	No	Not hypothermic
37-36	98-96	Yes (increasing with cold)	No	No	No	No	Cold Stressed – Not Hypothermic
35-34	95-93	Yes (increasing more)	Yes	No	No	No	Mild Hypothermia
34-33	92-91			Yes	No	No	
32-29	90-83	Shivering slows and stops	Little to no physical ability	Yes	No	Heartbeat and pulse becoming slow and/or irregular	Moderate Hypothermia
28-24	82-75	No	None	Yes - leading to lost reflexes	Yes	Decreasing signs of life including lost pain response	Severe / Profound Hypothermia
23-18	74-64	No shivering	None	No mental response	Yes	Heartbeat and breathing decline, pupils don't respond to light, then heartbeat undectectable	Near Death or Death (Death cannot be known in the field; Many recover from very low body temp.)

*Body core temperature cannot be measured with a standard oral thermometer. Normal body temperature is 37°C (98.6°F) orally, 38°C (100.4°F) rectally, but 38.5°C (101.5°F) inside the body.

Source of tables: Downing, J.A. Hypothermia: Understanding and Prevention. Universtiy of Minnesota Duluth: https://seagrant.umn.edu/programs/recreation-and-water-safety-program/hypothermia#:~:text=It%20has%20long%20been%20known,of%20water's%20high%20thermal%20conductivity.

See also: Tipton M, McCormack E, Elliott G, Cisternelli M, Allen A, Turner AC. Survival Time and Search Time in Water: Past, Present, and Future. J Therm Biol. This paper offers a comprehensive and nuanced analysis, providing original data and outlining the process through which the International Aeronautical and Maritime Search and Rescue Manual, developed by the International Maritime Organization, established its guidelines for search and rescue operations. The full paper can be accessed here: **https://www.sciencedirect.com/science/article/pii/S0306456522001632.**

Conclusion

Marine safety devices like PLBs, MOBs, and VHF radios are primarily designed for larger markets, such as commercial and fishing vessels and offshore operations. They are not specifically designed with surfskiing in mind, and as a result, they have inherent limitations. In general, these devices perform really well, but it's important to remember that they are not optimised for the near-shore conditions and rapid response required due to hypothermia risks in the environments where we typically paddle (see below). Interference with radio and phone signals from coastal mountains and inlets (blind spots) and potential delays in PLB satellite signals must be considered when relying on this equipment.

Proper insulation dressing is crucial in cold waters, as it markedly extends survival time until help arrives. Given our strong sun and the vigorous exercise we all do while surfskiing, this point often gets overlooked. Equally important is looking at the weather forecast because conditions like wind and visibility can change rapidly.

While the devices reviewed provide valuable passive safety, active safety is even more critical. Solid paddling technique, good balance, choosing the right boat, and mastering self-rescue—such as remounting in extreme conditions—are essential for preventing accidents.

Relying too heavily on skills, though, can be misleading: high skill doesn't eliminate risk, and reducing exposure doesn't guarantee safety. Both skilled and less-skilled individuals are still testing their limits, whether in big swells or calm waters. Ultimately, we are all vulnerable to unforeseen circumstances of various origins, and true safety demands a well-rounded approach. Accidents happen.

Personal risk management needs and financial resources are as diverse as the devices available, making choice a deeply individual matter.

An effective approach is that NSRI's SafeTrx should ideally be backed up by a second alert and homing option (e.g., PLB, VHF radio, MOB, SENDs) and perhaps also complemented by additional tools—remember, with a PFD, you may be just a head above the water—to assist and expedite the final 'handshake' or physical contact with the rescue crew (e.g., electric flare, mirror, whistle, strobe, pyrotechnic flares). All of it is securely tethered to the PFD and positioned above the waterline.

No stigma, no pride, no doubt. Make the call, get the help out!

Championing local safety services

NSRI donations www.nsri.org.za and you can order a transfer to National Sea Rescue Institute of South Africa Branch code 632005 Account 1382480607 (adding if you want "Stn10" as a reference to identify Simons Town)

Bank Details

ABSA, Heerengracht
Branch code: 506 009
Account number: 1382480607
Account holder: National Sea Rescue Institute
Swift code: ABSA-ZA-JJ

Important

Use your Cellphone number as a reference so we can acknowledge your donation
Send your proof of payment to donations@searescue.org.za

NSRI Coast Watchers Group comprises volunteers who live along our coastline, have a view of the water, and are willing to assist us occasionally when required. The NSRI station provides the necessary equipment and training and, when in need, is activated by the NSRI's EOC. If anyone has a good view of the ocean and would like to join the programme, they can contact info@searescue.org.za

Important local numbers and ancillary information

NSRI Emergency Operations Centre 087 094 9774
Cell Phone Emergency: 112, option 4 is for the NSRI

Phones in water pouches can be difficult to use—add shortcuts or speed dial. Consider adding "A_" to the above contacts for easy access.

Glossary

AIS, (Automatic Identification System) is an automatic tracking system for vessel tracking and emergency calls that uses transceivers on ships and rescue stations and operates on two dedicated VHF frequencies (161.975 MHz and 162.025 MHz).

COSPAS-SARSAT.INT International Satellite System for Search and Rescue.

(Emergency position-indicating radio beacon) is a type of emergency locator beacon for commercial and recreational boats. It is a portable, battery-powered radio transmitter used in emergencies to locate boaters in distress and in need of immediate rescue.

DSC, (Digital Selective Calling) is a standard for transmitting predefined digital distress alerts via the medium-frequency (MF), high-frequency (HF) and very-high-frequency (VHF) maritime radio systems. It operates on Channel 70 (156.525 MHz) for distress calls. Together with AIS, it is a core part of GMDSS.

GMDSS, Global Maritime Distress and Safety System, is a worldwide automated emergency signal communication system for ships at sea developed by the United Nations' International Maritime Organization (IMO) as part of the SOLAS (International Convention for the Safety of Life at Sea) Convention.

MRCC (sometimes referred to as MCC in other documents) Maritime Rescue Coordination Centre

RCC Rescue Coordination Centre

RDF (Radio Direction Finding), also DF, is the use of radio waves to determine the direction of a radio source. It offers direction but not distance.