

Marine Rescue Victoria Point

FLIREX

Introduction

On the evening of Tuesday 10 July 2018, an experiment was conducted to test the impact on Forward Looking Infra-Red (FLIR) cameras as a result of a person's temperature dropping while in the water.

Target details

The Target was:

Gender: Male

Age: 54

Height: 181cm

Weight: 81kg

A full body 5mm wet suit was worn along with neoprene diving boots for the first 40 minutes. It was considered that little or no degradation in signal had been noticed so the wetsuit and boots were removed for the remaining observations.

Vessels

Victoria Point 1

FLIR: FLIR Systems M-Series

Display: Furuno TZ14

Water Police Vessel Baggly

FLIR: FLIR Systems M-Series (M-625L AD1129)

Display: Unknown

Both vessels were anchored 30-50m from the Target. VP1 was anchored bow and stern which helped to ensure a consistent aspect to the Target.

Location

The swimming enclosure on the north of Karragarra, between the barge ramp and the ferry terminal was used for safety and convenience.

This was surveyed at low tide (0.4m) on the afternoon of Saturday 26 May 2018. The netting was just clear of the water and was in good order.

The FLIR image through the netting does not seem to cause any noticeable degradation in the picture.

Weather

Weather conditions on the evening were calm with a variable breeze of 5-10 knots. No precipitation was experienced. Water temperature was taken at 15.2 °C.

Tides

The evening of Tuesday 10 July 2018 had ideal tide conditions:

10-Jul	Height	Bar	Victoria Point	Macleay Jetty
Low	0.34	13:00	13:18	13:42
High	2.43	19:31	19:45	20:01
Difference	2.09			
Twelfth	0.174167			
+1	0.51		14:22	14:45
+2	0.86		15:27	15:48
+3	1.39		16:31	16:51
+4	1.91		17:36	17:54
+5	2.26		18:40	18:57
High	2.43		19:45	20:01

One factor which was a slight challenge for the target was the current which was pushing hard against the ramp side of the enclosure net. This meant it was only feasible to position close to the net and hold off with feet. It also made changing life jackets more difficult.

Life-Jacket Configurations

The Target swapped between:

- No life-jacket
- Level-50 kayak life-jacket
- Inflated Stormy Seas Level 150 – no sleeves

The Target rotated through these configurations every 5 minutes.

Summary

Target

The Target was reasonably comfortable in the water while wearing the wetsuit experiencing slight shivering after about 30 minutes. Once the wetsuit was removed then the Target got cold very quickly with more significant shivering and slight leg cramps. Note that the recommended foetal position to retain heat was intentionally not used. It is estimated that the Target would be unlikely to stay in the water for a full hour without a wetsuit though this could be expected to vary from person to person.

Images

Photographs and other observations are all recorded at Appendix A.

The FLIR images themselves were clear and effective.

Taking photographs of the FLIR displays in the dark was not considered very successful. The TZ14 has an app which allows a mobile device such as an iPad to act as a slave display. Taking screenshots on an iPad using this app delivers considerably improved images as below. This technique is recommended for any similar activities where possible.



Wave impact

While conditions were calm during our experiment, the odd passing vessel did cause minor wave activity and the Target often ducked under the water while changing life jackets. The FLIR image at this time was either non-existent or significantly reduced. The inference from this is that FLIR from a vessel would be of limited value in rougher sea conditions while looking for a person in the water.

Results


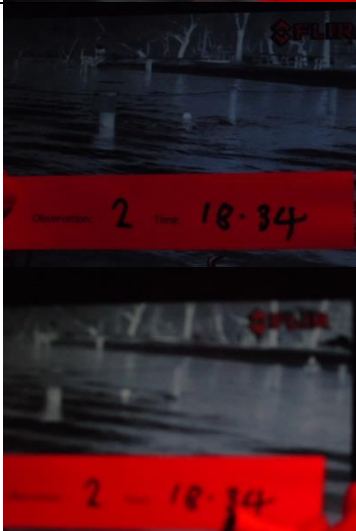
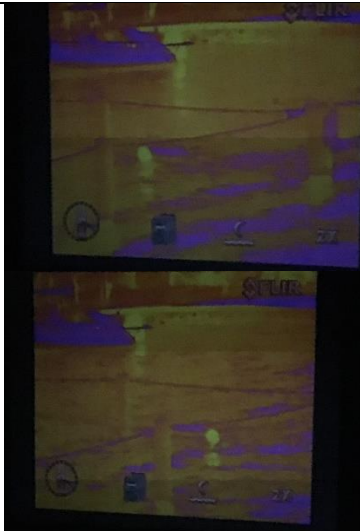
The FLIR images did not noticeably degrade due to temperature loss. It is believed this is likely due to the body drawing heat from extremities to retain heat in the core and head. What was noticeable was the difference between the different life jacket configurations. When wearing a life jacket the target is more buoyant and so has more head and shoulders above the water providing a better signal for the FLIR. No life jacket is obviously the opposite. The level-150 Stormy Seas was also a noticeable improvement over the level-50.


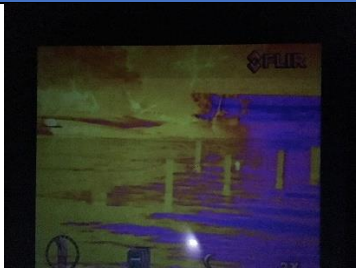
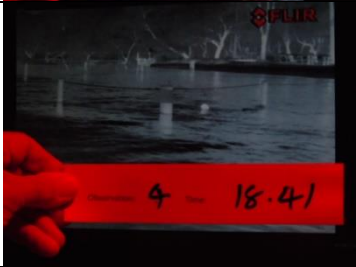
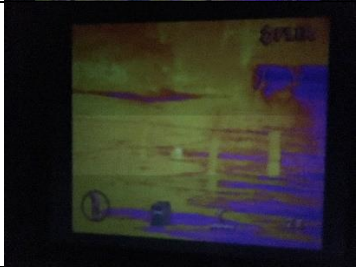
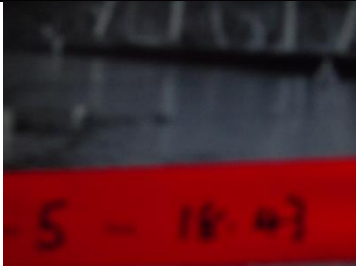

Contact







Any questions or should be addressed to:

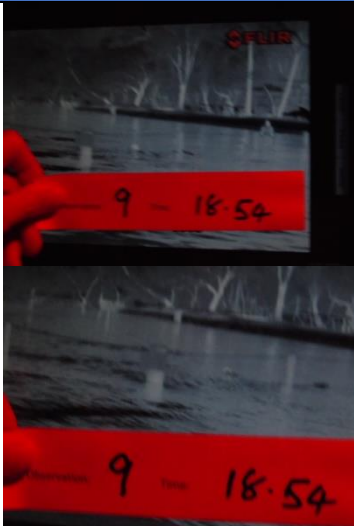

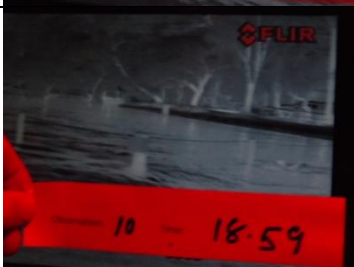

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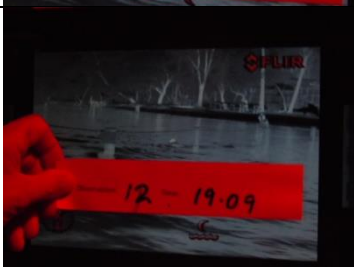

Appendix A


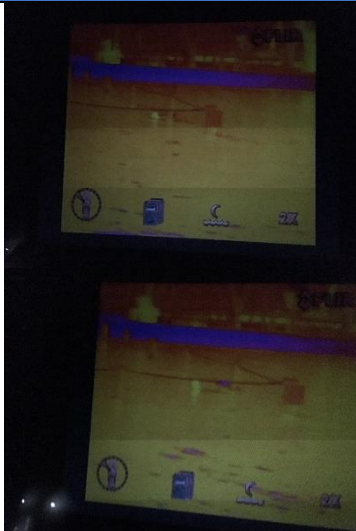
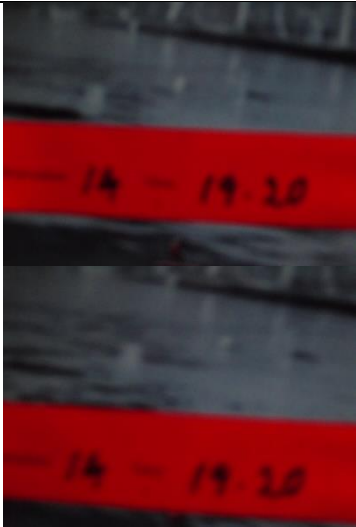

ID	Minutes	Lifejacket	Victoria Point 1		Water Police Baggly	
			Image	Comments	Image	Comments
1	0	None		Head clearly visible	No image	Aerial interference
2	+3	Level 50		Head clearly visible – slightly higher in the water		

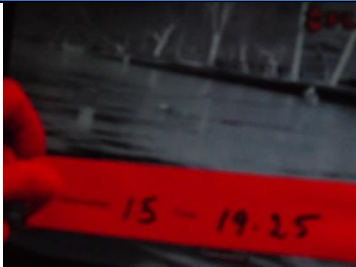
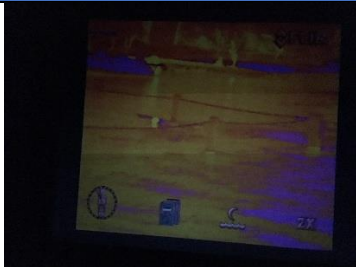
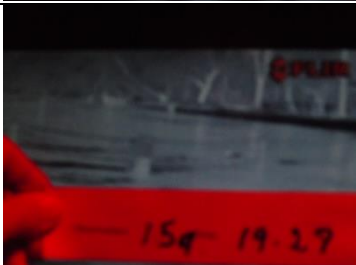
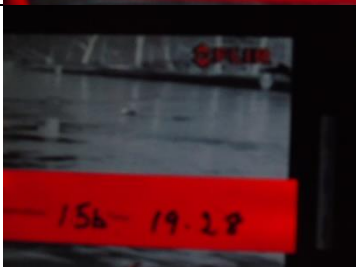
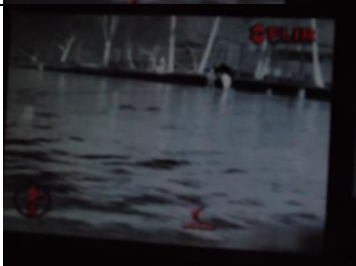
ID	Minutes	Lifejacket	Victoria Point 1		Water Police Baggly	
			Image	Comments	Image	Comments
3	+5	Full Coastal		Head clearly visible – Sitting higher still in the water		
4	+7	None		Head clearly visible – Lower in the water		
5	+12	Level 50		Head clearly visible – Again higher in the water		

ID	Minutes	Lifejacket	Victoria Point 1		Water Police Baggly	
			Image	Comments	Image	Comments
6	+16	Full Coastal		Head clearly visible – Again highest position in the water		
7	+18	None		Head clearly visible – Low in the water		
8	+20	Level 50		Head clearly visible – Again higher in the water but less than before (L50)		

ID	Minutes	Lifejacket	Victoria Point 1		Water Police Baggly	
			Image	Comments	Image	Comments
9	+25	Full Coastal		Head clearly visible – Again highest position in the water but less than before		
10	+30	None		Head visible Attempted to take body temp at this stage. Could not get a reading. Water temp 15.2deg		

ID	Minutes	Lifejacket	Victoria Point 1		Water Police Baggly	
			Image	Comments	Image	Comments
11	+35	Level 50		Head visible – lower in the water		
12	+40	Full Coastal		Head visible – Dave commented he felt warmer in the full coastal		

ID	Minutes	Lifejacket	Victoria Point 1		Water Police Baggly	
			Image	Comments	Image	Comments
13	+45	None		Head visible Dave decided to remove wet suit at this point. Very visible once wet suit removed and out of the water Head visible but low in the water		Entered water with no wetsuit/no jacket No light – no difference
14	+51	Level 50		Head visible		No wetsuit

ID	Minutes	Lifejacket	Victoria Point 1		Water Police Baggly	
			Image	Comments	Image	Comments
15	+56	Full Coastal		Head visible Dave advised he was starting to experience cramp		Very cold
				Head less visible low in water		
				Head visible but much lower heat reading		
				Note the much more noticeable FLIR image once the wet suit was removed but before re-entering the water		