INFRARED TRAINING CENTER

INFRAMATION

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ACCIDENTAL WINTER BATHING – HOW COLD DO YOU GET?

*By Bo Wallin, **itc** International Course Moderator*

There are people, like the one in the picture below, who love to move around – often at quite a high speed – with only a few centimeters of safety margin to the deep, cold water. It is called skating. An example is shown by the guy, actually the author of this report, who is standing in the middle of Stockholm, just a meter from a refreshing winter swim.

Of course, the idea with skating on lakes and at sea is not to test the temperature of the water all that often, but it cannot be avoided from happening now and then. So skaters are very aware of the risk and consequently also very well equipped for it, should it happen. And it happens to everybody, sooner or later.

The most frequently asked question to these skating maniacs is, by far: "Is it not dangerous and above all, very cold to go through the ice?"

There is inevitably some danger involved, but that is taken care of by experience, help and good equipment.

How about the very cold water? All of us, who have tested 'the real thing', are unanimous about one thing, you do not feel the cold as long as you are in the water. This is obviously a very subjective feeling, so in order to get a more objective opinion about it, I took a thermal camera with me to a 'bathing exercise', i. e. when people under conditions, where safety is put in the front room, deliberately – and voluntarily – go through the ice in order to feel the sensation – and earn a special 'hero' badge.

This exercise took place on a dull and wet – it was raining – January day 1999. The air temperature was about +3ºC. The water under the ice is invariably 0ºC. The exercise is carried out so that the skater slowly approaches an area with thin and brittle ice, which is bound to break, and then save herself or himself back up onto secure ice – in order to as quickly as pos-

Inside this issue:

INFRAMATION 2000 - ALMOST HERE!

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The conference, which will be held September 24-27, 2000 in Orlando, focuses on the development of effective Thermographic Inspection techniques and procedures in a wide variety of Industrial and Research settings. The conference also serves as a user's meeting for all AGEMA, Inframetrics and FLIR camera users.

The InfraMation 2000 conference is sponsored by The Infrared Training Center and FLIR Systems and is held on an annual basis. Registration information can be obtained at www.inframation.org or call 1 800 GO INFRA for more information.◆

WINTER BATHING (CONTD.)

(Continued from page 1)

sible change to the dry clothes we are always carrying in our water-tight backpacks when skating.

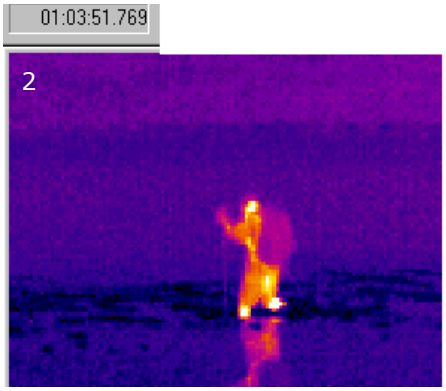
The intention with this study was to find out how cold this exercise really is, i.e. what are the temperatures on the body right after 'bathing' and for how long.

The following series of thermograms give us some information about that. They are all taken with the AGEMA 570 uncooled (sic!) infrared camera.

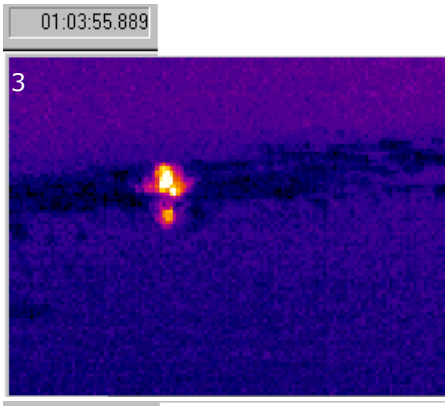
Let us first look at a thermogram of a skater, who has not yet been in the water.

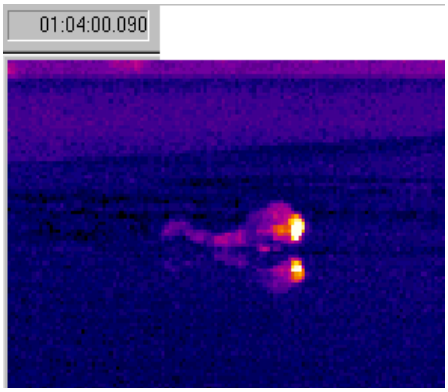
The temperature is highest in the face, about 27ºC, skating is quite a hard work! The clothes insulate with varying efficiency, hence the temperatures on the body spread down to a few degrees C above zero. We are usually dressed in quite thin clothes to get rid of the excess heat produced by the skating effort.

The following series of thermograms show a man, probably with a beating heart, bravely – but voluntarily – sets out to 'bathe'.



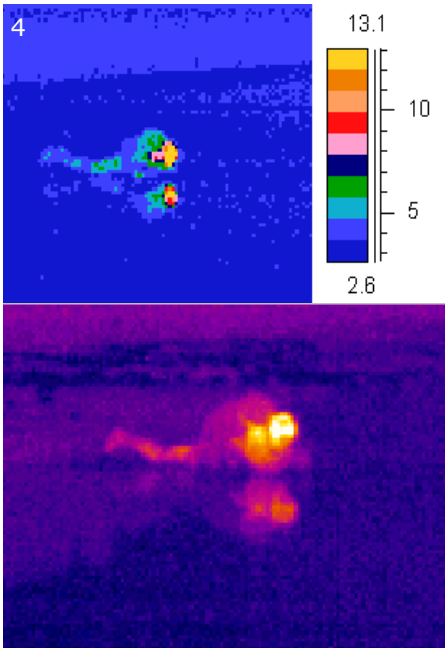
Note the time when he breaks the ice., 3:51 (min, sec)





Oops, in the water. Note that he is floating on the backpack. Then he turns around and helps himself up by means of the special spikes, made exclusively for this purpose.

And after less than 10 seconds (!!!) he is back on the ice. This may, however, not always be the case, but there is at least 20 minutes available before he is in deep trouble.



See the temperatures on the body, now very close to the water temperature of 0ºC. Having come up out of the water, he first crawls on the belly, then as the ice under him grows thicker, he moves on arms and knees until he finally stands up to skate away to change clothes. Note that the body temperature slowly penetrates the wet clothes. Only now he feels that he has been down in very cold water. *(Continued on page 3)*

YOUNGEST STUDENT

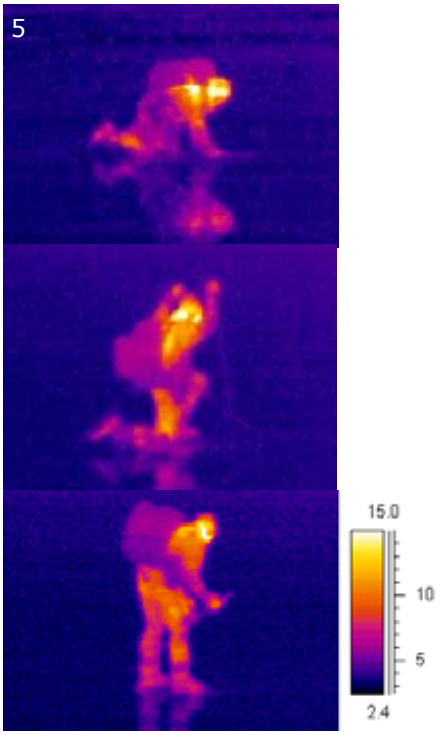
This little fellow is starting his thermography career the right way, by attending itc training!

MEET THE STAFF - RON LUCIER

Ron is an Infrared Course Moderator at the **itc**. He earned his B.Sc degree in Mechanical Engineering from Worcester Polytechnic Institute and holds an EPRI Level III Infrared certification. He has been actively teaching and consulting in infrared thermography since 1984, accumulating over 1000 hours of active thermography inspection time. He began the infrared predictive maintenance program at Yankee Atomic Electric in 1984. In total he has over 22 years of thermography applications and teaching experience, spanning all industries from electric power generation to paper mills.

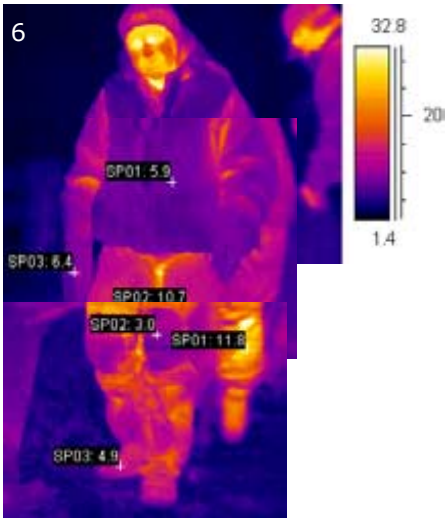
Ron is also a HAM radio operator and a volunteer fireman. He has taught many fire departments how to deploy and utilize IR imaging systems.◆

WINTER BATHING (CONTD.)

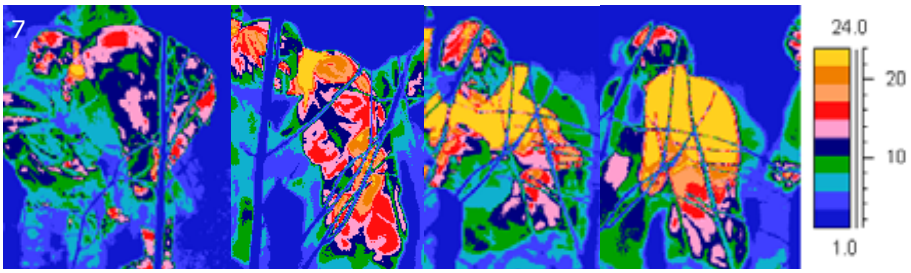


And when he has reached safety ice (about 5 cm thick) and can stand up, the clothes have reached a temperature of 8-10ºC, this because it is quite an effort to fight yourself up from the water and then to crawl over the brittle ice, hence you get quite warm, which is clearly shown in the thermograms.

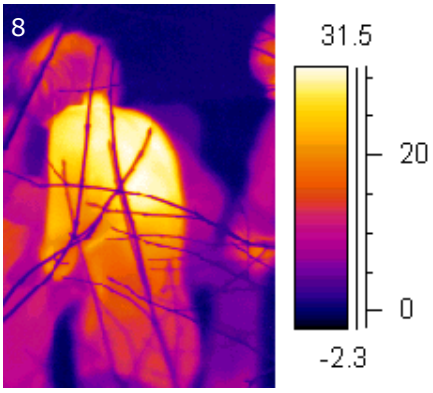
From wet and cold to dry and warm



This lady has just come up from the hole in the ice. Note that the face is 33ºC, i.e. hot after the effort to get back. The clothes insulate differently and they are wet and cold. The trousers have not warmed during the crawling on the ice, as they have been exposed to the cold water on the ice all the time. The arm looks warmer, obviously.



These thermograms, all with the same temperature scale, shown to the right , shows that the body temperature comes through as the wet and cold clothes come off.



The final thermogram shows normal body temperatures after having taken off the cold clothes and being rubbed with a dry towel.

So, it normally takes less than a minute to get out of the hole you have made through the too thin ice, it takes about another minute to get onto secure ice. Finally it takes 10-15 minutes to undress, dry and then jump onto the dry clothes that are always carried in the backpack.

As you should never skate alone, there are friends to help you out of the water and to get into dry clothes as quickly as possible. This is particularly appreciated when the temperature is maybe –15ºC.

And, after all, the thermographic images show that it is not that much of a 'near death' experience. Many people seem to think so. That is not true! Try to avoid it but be prepared for it to happen.

Because then you might be able to experience this:

The island Svenska Högarna, situated at the edge of the Stockholm archipelago, about 100 km east of Stockholm.◆

You can contact Bo at Bo.Wallin@flir.se—Editor

> *"the thermographic images show that it is not that much of a 'near death' experience. "*

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About the Infrared Training Center

The Infrared Training Center offers training and certification in all aspects of infrared thermography use. Our world-class training facilities are located near Boston, Massachusetts, USA and Stockholm, Sweden and have the world's most extensive hands on laboratories for infrared applications. Please join us in exploring the fascinating world of infrared!

Your comments and suggestions about this newsletter are welcomed and encouraged. If you have an interesting application or case study to share, we encourage you to submit it for publication.

Please e-mail to Gary.Orlove@flir.com or snail mail to the USA office

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- December 11-15 (W50)

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