Think Thermally®

Spring / 2007

Practical news for practicing thermographers

Webinars Now Available From Snell Infrared

Snell Infrared is now offering a series of regularly scheduled webinars designed for thermographers who use thermal imaging for both condition monitoring and building applications.

For those new to the concept, a webinar is simply a short online seminar on a particular topic. Anyone with a computer, a telephone connection, and internet access (minimum 56kbps internet connection) can participate.

These webinars combine the expertise of the industry's largest and most experienced independent knowledge provider with the convenience of an online training interface. Each seminar is taught by the same trusted experts for whom Snell Infrared is internationally recognized and are presented in real-time with an interactive question and answer period. Most of the courses run about 75 minutes in length and are available for $79 USD per person/per session.

Snell Infrared has developed these webinars so that all thermographers, whether they work in building applications or predictive maintenance, can supplement their knowledge quickly and easily online without having to take time out to travel and attend training.

Webinar Schedule – Summer 2007

June 21 at 11:30 a.m. EDT

Introduction to Spot Radiometers

Spot radiometers can provide a quick, inexpensive means of taking non-contact temperature measurements. Unfortunately these powerful devices are often misused and/or misunderstood, resulting in data collection that is questionable or even inaccurate. This presentation will discuss the primary considerations for using spot radiometers successfully in condition monitoring and building diagnostics.

July 25 at 12:15 p.m. EDT

Successful Electrical Inspections Using Infrared

The majority of infrared cameras purchased today are used for inspecting electrical systems. While the technology is considered one of the primary test methods for electrical equipment, there are limitations with infrared which, if not understood correctly, can be simply misleading or even downright dangerous. This presentation details how to successfully inspect electrical systems, safely and effectively, including conditions needed, typical patterns detected and an understanding of how to prioritize findings.

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In This Issue:

Thermal Reflections

John Snell, ASNT NDT Level III
President – The Snell Group

Think Thermally® is a publication of The Snell Group, the leading provider of asset reliability and efficiency solutions using infrared technology and motor circuit analysis.

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At the risk of sounding preposterous, I predict we will look back on 2007 and say "It was the best of times and the worst of times" for this remarkable technology of infrared. I first used an infrared camera, a Hughes Probeye™, in 1983. Even if I'd had an infrared crystal ball, I never could have envisioned where we would be 24 years later.

The "best of times" has brought us many excellent choices of lightweight, fully featured, thermal imagers costing less than ten thousand dollars! Image quality, even on these so-called "low end" systems, is nothing short of astounding. While large 640x480 detectors are making their way into the hands of thermographers, 160x120 and smaller focal plane array systems have turned the market upside down! Many have thermal sensitivities well under 70mK – unimaginable even several years ago.

Applications have also "boomed" in response to the influx of new cameras. The building market is very strong, led by moisture detection and, with rising energy costs, insulation and air leakage diagnostics. At the same time on the condition monitoring side, infrared cameras are becoming as common as a tool box with many thermographers using them on a daily basis. Many consulting thermographers too have risen to the challenge and found new ways to work with their old customers who now possess the technology themselves.

So, if all this represents the "best of times," why do I also suggest we are in the "worst of times?" As the availability of thermal imagers proliferates we are seeing more unqualified people than ever beginning to use them. Mistakes are being made, some serious. It will not take many to make us all look bad.

Clearly I have a bias for wanting people to be trained to use the technology. That fundamental concern is reinforced in every course I teach. Many people come to our training classes unaware of what they do not know. Today's cameras are unbelievably easy to operate and the suppliers go to great lengths to convince the end user that thermography is as simple as taking a picture.

Unfortunately changes in the laws of physics have not kept up with the evolution of cameras. Without an understanding of heat transfer, radiometric theory and the basics of the applications, even the most user-friendly camera can quickly yield the most dangerous results. Sooner or later a misstep by an unqualified thermographer will land them in court or worse.

All of us can do our part to ensure the industry continues to grow in a productive manner. Know your limits and work within them. I encourage you to set-up a certification program that complies with ASNT or ISO standards. Educate your customers so that they know the difference between work that is good and that which needs improvement. Consider lending a hand to develop professional standards we can all use. Share what you have learned on messageboards, in articles or at conferences.

The market will bring us even lower cost cameras in the near future and even more people will begin using them. It is in the best interest of all thermographers to do what we can to ensure this incredible technology is applied safely and properly for the next 24 years and beyond.

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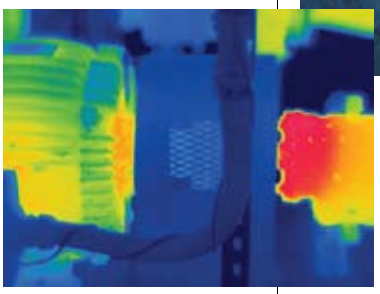
Roy Huff, ASNT NDT Level III
Sales & Business Development Manager – Snell Inspections

IR and Motor Circuit Analysis: Part II

For those of you just tuning in, I would like to take a moment and recap our last "Lesson from the Field" from the Winter 2007 issue of *Think Thermally* (available online at www.snellinfrared.com. Just follow the links to *Think Thermally*).

During a routine mechanical inspection an anomaly was identified on a pump/motor asset. In an attempt to better diagnose the problem another technology, Motor Circuit Analysis (MCA), was reviewed to help correlate the two technologies. Both test methods indicated a problem with the system and an alignment was planned and scheduled. During the alignment process it was also decided to replace the coupling insert.



In a condition-based maintenance program, re-qualification or re-assessment of a repair is critical. We find that approximately 50% of repairs fail to fix the anomaly and eliminate the defect. So for a facility to make the assumption that a reported anomaly has been successfully repaired after the work order is completed can set them up for an asset failure or worse yet, the failure of their entire reliability program.

When re-qualification of the mentioned repair was conducted, the following result was detected.

The component temperatures were reduced but not to the point with what would be expected from a defect free system.

What next? Additional testing with other technologies? Increased inspection frequency? These questions could have already been answered when establishing the condition-based program. A criticality assessment, failure modes and the appropriate technologies to identify them (inspection frequencies and routes) are all part of the successful condition-based monitoring program.

Understanding the failure modes and the asset criticality will help both production and maintenance determine the appropriate path. Is the motor critical to production, safety or environmental requirements? Is there a redundant system? Does it operate 24/7? Is there a scheduled outage in the near future? Knowing the answers to these questions will allow for proper planning and scheduling of the repair. It is a difficult step but facilities must move away from optimizing failures and move toward eliminating defects for them to remain competitive.

Webinar Schedule – Summer 2007 Continued

August 1 at 1:15 p.m. EDT

Infrared Windows and Viewports

Many thermographers or program managers are considering installing infrared transparent windows or view ports mainly to increase the safety of electrical inspections. This presentation will detail the important factors which need to be considered including cost, safety, placement and use of these devices.

Participants can register for all webinars right online at https://snellinfrared.webex.com including paying the $79 fee using Visa, Mastercard or American Express.

Questions can be directed to webinars@snellinfrared.com or by calling 1-800-636-9820.

"In a condition-based maintenence program, re-qualification or re-assessment of a repair is critical."

Who's on First? How Teamwork Benefits Your Program

Dan Thurmond
Infrared Trainer – Level II Thermographer, Snell Infrared

In a previous issue of *Think Thermally*® I talked about how to get started with your program after returning from infrared training. In this edition I would like to address the why, who and how of team building as one of the critical steps needed to successfully complete such a task.

To address team building, however, let's first think about all the possible team sports, whether it is baseball or curling, and what they have in common. The success of a team involves much more than having a bunch of well trained and gifted players take the field. It may be a cliché, but we all know that many times everyone must work together in order for a team to win.

Another aspect of a "team" can be found in its definition from Webster's dictionary. Simply put, a team is "a number of persons associated for a common goal." These "persons" are represented by the owner, management, coaching staff, and players who all strive towards the common goal of winning. When each one of this diverse group effectively uses their individual resources and skill sets, pennants are won and medals are awarded. A breakdown or disconnect in any one sector, however, can mean a disastrous result for everyone involved.

As thermographers, many of us can define "winning" as running an effective infrared program. To do so, however, there must be a common goal such as increasing equipment reliability that improves uptime and, ultimately, yields cost savings.

Besides this common goal, it is critical for the individual players to be motivated for success to happen. How individuals of a team find motivation varies from person to person. Motivation can be defined as the "incentive" to act or, even more simply as the "what's in it for me?" Admit it or not, we all respond to incentives of one kind or another. For example:

Owners, shareholders and executives might have the motivation of return on investment. Management is motivated by product yield by supplying operational funding within budget constraints to keep the gears turning, the executives smiling and the employees working.

Coaching staff (think supervisors) matches the need, resources and manpower to fulfill their motivation of keeping equipment running while meeting production goals with the promise of an eventual promotion.

The players (technicians/tradesmen) are motivated by the challenge of learning and applying a new technology to make their jobs more productive, interesting and enjoyable. Of course there is always the idea of better pay or more overtime.

When initially building or adding additional teammates to your infrared program, ask for recommendations from existing members; look for those individuals who have shown interest in the technology even before being considered for your team. Because of the nature of condition monitoring some degree of autonomy will have to be afforded to the team members so having an individual who is highly motivated at self-starting is a must. Don't be timid about inquiring about their track record during past assignments as each member will have a significant impact, either positively or negatively, on the overall effectiveness of the team's endeavors. It is always more difficult to remove a disruptive or unproductive member later.

Suggested questions for candidates should include:

- Why do you want to be part of the infrared team?
- State the team's common goal and ask the candidate "are you willing to make that goal a priority?"

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Rants and Raves – Thermal Solutions®

Jim Fritz, CEO
The Snell Group

Before I begin my first rant (actually a rave in this case), I thought it would be good for you, the reader, to know that I have avoided writing much at all for *Think Thermally* as there never seems to be enough time. However, due to a recent bout of my ranting and raving on a particular segment of the industry, it occurred to me that this would be a great opportunity to participate once again. The focus of my writing will be about both the good (and sometimes not so good) things that make up the infrared industry from my personal perspective. So, for my first column, what better way to start than on a positive note (even though I admit I am completely biased on the subject).

I always love to participate in gatherings that are professional, yet informal enough for people to feel at ease, where they can gain a wide range of knowledge on a variety of topics. Such is what happened a few months ago in Sarasota, Florida at the 2007 Thermal Solutions® conference. Of course being from Vermont one can truly appreciate going south for any reason during the winter. And, as I have been described lately as "portly", I obviously enjoyed the wide variety of food as well. But it was the community feeling of knowledge sharing I got from the conference I enjoyed the most.

People learn in different ways and I personally believe that is one of the strongest points of this infrared-specific, camera-neutral conference. For example on Monday there were a number of topics explored in-depth through a wide variety of short courses. Subjects ranged from moisture in buildings and calculating energy savings in the buildings track to presentations on infrared windows and ports, motor testing and NFPA 70E on the condition monitoring side of the conference. One short course, The Secrets of Running a Successful Service Business, was presented by two friends of mine: Jim Treat and Chuck Hellier. Both are successful businessmen, yet you feel like you can stand around and talk with them all day long about business. They hold nothing back and give a great, unbiased perspective while challenging you to think.

"People learn in different ways and I personally believe that is one of the strongest points of this infrared specific, camera-neutral conference."

Scenes from Thermal Solutions 2007 conference.

The year's line-up of conference exhibitors are a great bunch of people. Without them, we would have no reason to gather together to talk about this amazing technology. They are very good at disseminating useful information about their products and how they can help thermographers with their work. As part of the Exhibit Hall, this year's Exhibitor Appreciation Reception was another resounding success made possible in large part by the generous contribution of prizes from the exhibitors in attendance. Conference attendees won a variety of personal and professional gifts, with one even going home with an infrared camera!

There were some great special keynote speakers that made us all think about how we use and present our thermal information to others, the importance of condition monitoring and NDT in industry today as well as how infrared is being successfully used on the Space Shuttle. The speakers included Alan Pride of the Smithsonian Institute, Danny Parker from the Florida Solar Energy Center, Chuck Hellier of Rockwood Industrial Services, and Dan Ryan from United Space Alliance.

Several dozen papers were delivered by a wide range of presenters grouped into two tracks: Condition Monitoring and Buildings. For those attending it was a time to discover how infrared is applied in a wide range of industries. They should be commended for their hard work and their willingness to share professional experiences so that others may learn.

Beyond paper presentations, two panel discussions proved to be one of the more interactive experiences of the conference. Both discussed inspection standards in the industry with one on buildings, the other focusing on condition monitoring. The discussions were very good, stimulated by the panelists' insights and knowledge on the topic, and showed both the failure and promise of the industry in relation to existing standards.

Finally, I would like to extend thanks to a diverse group of 15 people who agreed to participate in this year's

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Who's on First? How Teamwork Benefits Your Program

Continued from page 4

- Can you be a "team player" and what does that mean to you?
- Can you work in a close and cooperative effort with these specific individuals: management, supervisors and hourly personnel? (Give the names and their role on the team)
- Are you willing to be actively mentored by these supervisors and peers?
- What is your motivation for becoming part of the infrared program? (The "What's in it for you?") Be cautious of the individual who says he expects no personal gain.
- What skills do you bring to the team?

Make sure they understand there will be formal training with class work followed by exams.

I also suggest giving each candidate a fifteen to thirty day mutual trial period during which they can shadow the experienced thermographers observing all that will be expected of them. This period allows all parties involved to examine the personnel fit as well as the training and time commitment required.

A well thought out and constructed infrared team can meet or exceed both common site goals as well the expectations of each team member, provided that a spirit of mutual trust, respect and cooperation prevails. The whole team shares in the rewards of "getting the first base hit." So the question "who's on first?" or who gets the accolades doesn't really matter. Whether a base hit or home run, everyone contributes, everyone cheers, everyone profits.

Rants and Raves – Thermal Solutions

Continued from page 5

"Ask the Expert Forum". These individuals, each with a proficiency in a particular field, made themselves available to speak with attendees one on one – asking for help, verifying previous work and always challenging each other to do better.

I would like conclude with a challenge to the entire infrared community. Don't stop exchanging ideas and information. Learn more about the great equipment choices that are available. Discover how to use your own infrared imager and software to become even more proficient on creating reports and routes. Stay involved in the industry by listening to what others are doing with similar problems and circumstances. Be proactive and share your experiences by finding new ways to work with others at your plant, or your customers, so that you may be even more valuable to them.

Have a rant or a rave that you would like address? Please feel free to contact me: jefritz@snellinfrared.com.

2007 Thermography Training Schedule

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LEVEL I	DATE	$1,595
Minneapolis, Minnesota	June 4-8	
Montreal, Quebec (French)	June 4-8	
Toronto, Ontario	June 18-22	
Montpelier, Vermont	July 16-20	
Toronto, Ontario	August 13-17	
San Diego, California	August 13-17	
Charlotte, North Carolina	September 10-14	
Manchester, New Hampshire	September 17-21	
Toronto, Ontario	September 24-28	
Indianapolis, Indiana	October 15-19	
Toronto, Ontario	November 5-9	
San Antonio, Texas	November 5-9	
Montpelier, Vermont	December 3-7	
Toronto, Ontario	December 10-14	

LEVEL II*	DATE	$1,595
Charleston, South Carolina	June 4-8	
Montpelier, Vermont	July 16-20	
Montreal, Quebec (French)	September 10-14	
Cincinnati, Ohio	September 10-14	
San Antonio, Texas	November 5-9	
Toronto, Ontario	November 12-16	

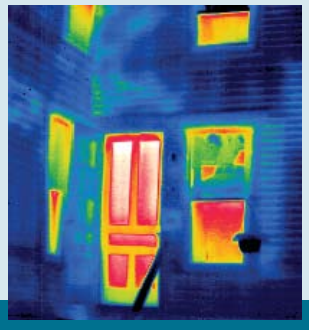
LEVEL III	DATE	$1,950
Montpelier, Vermont	June 4-8	
Toronto, Ontario	October 22-26	

BUILDING SYSTEMS*	DATE	$1,095
Chicago, Illinois	June 12-13	
Cincinnati, Ohio	September 20-21	
Montreal, Quebec (French)	November 21-22	
Toronto, Ontario	December 6-7	

ELECTRICAL APPLICATIONS*	DATE	$1,095
Montreal, Quebec (French)	June 14-15	
Cincinnati, Ohio	September 18-19	
Toronto, Ontario	November 29-30	

MECHANICAL EQUIPMENT*	DATE	$1,095
Cincinnati, Ohio	September 20-21	

NON-DESTRUCTIVE EVALUATION OF MATERIALS
Available. Please Call.



Snell Infrared International - South Africa and United Kingdom

LEVEL I	
Birmingham, United Kingdom	September 3-7
Johannesburg, South Africa	November 5-9

LEVEL II	
Bridgend, United Kingdom	October 22-26
Johannesburg, South Africa	November 12-16

LEVEL III	
Johannesburg, South Africa	November 19-21

MECHANICAL EQUIPMENT	
Johannesburg, South Africa	November 22-23

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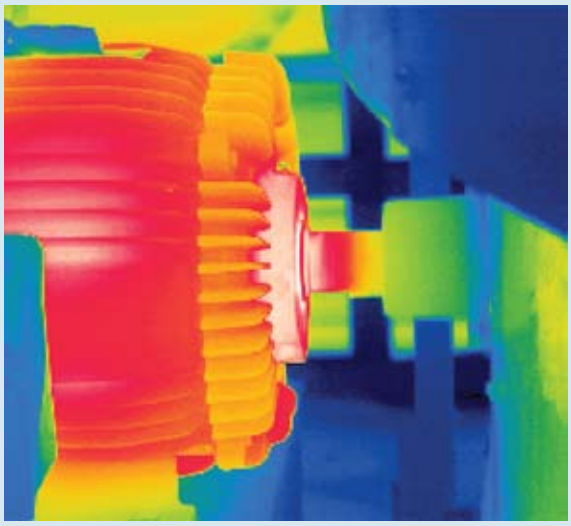

* Level I or Introduction to Infrared training required.

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The latest issue of ThinkThermally®

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Thermal Solutions™

A Conference for Professional Thermographers

Sarasota, Florida – January 21-24, 2008

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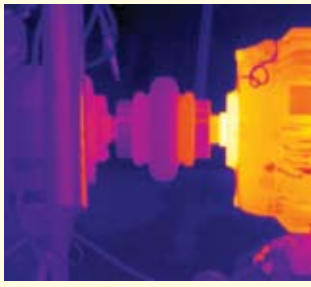
The Snell Group is looking for anyone interested in presenting a paper at next year's conference. Please write a brief abstract (100-200 words) and submit it for review by the Conference Steering Committee.

All papers must be ***non-commercial*** in nature and ***will be published*** in the Thermal Solutions Proceedings in both print and electronic format **by June 1, 2007**.

Abstracts sought on the following subjects:

- Electrical Applications
- Mechanical Equipment
- Building Diagnostics
- Moisture Intrusion
- Mold Detection
- Roof Moisture Surveys
- Program Management
- Case Studies in Thermography



Please submit an abstract using one of the following methods:

E-mail: abstracts@thermalsolutions.org • **Fax:** 802-223-0460.

Mail: Thermal Solutions *Call for Papers 2008,* P.O. Box 6, Montpelier, VT 05601 USA

Papers Due June 1, 2007