

Snell Infrared 2001 Course Schedule

Level I

January 29–February 2, Montpelier, VT
January 29–February 2, Toronto, Canada
February 12–16, Phoenix, AZ
March 12–16, Tampa, FL
April 2–6, Indianapolis, IN
May 7–11, Charlotte, NC
June 4–8, Montpelier, VT
July 23–27, Montpelier, VT
August 6–10, Seattle, WA
September 10–14, Kansas City, MO
September 24–28, Montpelier, VT
October 15–19, Cincinnati, OH
October 22–26, Toronto, Canada
November 5–9, Dallas, TX
December 3–7, Montpelier, VT

Level I Review Course with Certification Exam

March 20–22, Montpelier, VT
August 21–23, Montpelier, VT

Research, Development & Testing

February 20–23, Phoenix, AZ
October 29–November 2, Phoenix, AZ

Level II

February 12–16, Phoenix, AZ
April 2–6, Charlotte, NC
May 14–18, Toronto, Canada
June 4–8, Kansas City, MO
August 13–17, Montpelier, VT
September 24–28, Nashville, TN
November 5–9, Dallas, TX

Level II Review Course with Certification Exam

March 27–29, Montpelier, VT
August 28–30, Montpelier, VT

Level III, Best Practices

February 13–15, Phoenix, AZ
September 18–20, Montpelier, VT

Non-destructive Evaluation of Materials

Level I
April 23–27, Detroit, MI
October 15–19, Detroit, MI
Level II
July 16–20, Detroit, MI

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Training, Certification and Support for Thermographers

Snell Infrared



March 2001

Practical news for practicing thermographers

Thermal Solutions® 2001

Inside:

- 2** ...in the Press
- 4** Interview with a Thermographer
- 5** Where'd Ya Wear It?



It was clear from the start that Thermal Solutions® 2001 would be a huge success, and there were no arguments about that from any of the more than one hundred and thirty people who attended. Conference participants found the short courses, presentations, keynote addresses, vendor displays and field trips all valuable.

Building on the success of our June, 2000 conference in Indianapolis, Snell Infrared worked hard to design this conference to exceed the professional expectations of practicing thermographers. "I am acutely aware of how much it costs a company to send a thermographer to this conference," said John Snell. "Knowledge and professional contacts are certainly valuable. We did everything we could to pack Thermal Solutions® full of extra value so that it provides a real return on investment."

Six optional short courses offered on Sunday and Monday were well attended. They provided clear, focused training on topics of direct interest to new and practicing thermographers. Brian Yarborough (HSB Inspection Services) said, "This year I attended three of the short courses: *Electrical Inspections*, *Other P/PM Technologies*, and *Inspection of Buildings*. Even though some of the information was a refresher, I was able to get something new out of each of them."

The conference kicked off with a dinner

(continued on page 3)



...in the Press

Many company friends have been in the press lately. **Bob Rice**, a thermographer at the General Motors Fairfax Assembly Plant, recently wrote an article that appeared in *P/PM Technology* magazine entitled "Hunting for Equipment Anomalies with Infrared Thermography." Bob shares his perspective on finding problems with electrical connections, hot components and poor cooling. To read the entire article, please go to our website and download the pdf. Congratulations Bob, and thanks to *P/PM Technology* magazine for allowing us to share it with you!

Deborah L. Grubbe P.E., a keynote speaker at this year's successful Thermal Solutions® Conference, also recently appeared in the press. As Corporate Director of Safety and Health at DuPont, Deb has been named as one of 50 engineers you should meet this year. If you'd like to learn more about Deb and why she is someone to watch, go to <http://www.eweek.org/2000/Engineers/theengineers/Grubbe.shtml> and read all about it. Congratulations Deb!



Lowry Eads, Global Infrared Resource Manager at DuPont, was recently featured in *S.E.E. Focus*. The Spruance Equipment Examiners (S.E.E.) are responsible for ensuring the mechanical integrity of Spruance equipment through non-destructive inspections. The article summarizes an earlier article Lowry, Richard Epperly (also of DuPont) and John Snell (of Snell Infrared) wrote that appeared in the March, 2000 issue of the *ASHRAE Journal*.



Lois Broeker, an NDT Manager at the Niagara DuPont facility, was recently featured in *Insulation Outlook* magazine in an article entitled "Seeing the Light." In the article, Lois shares several success stories about using infrared thermography in her NDT work at the Niagara plant.

And if you attended the Thermal Solutions® Conference a few weeks ago, you know that Lois has some very interesting images from her facility, as well as the zoo (her other infrared passion)!

Speaking of both Lois and Lowry, they were featured together recently in an internal company publication. It was announced that Lois will become Co-Chair of the Corporate Leadership Team along with Lowry.

Congratulations Lois, Lowry, Deb and Bob! It's good to see you ...in the Press.

Messageboard Improvements

Our website keeps growing in popularity. One of the most active areas is the Messageboards. We receive hundreds of postings every quarter on each messageboard: Thermographic Applications, General Thermography and Classified. This popularity has led to a problem of slow-loading pages.

To remedy the situation, only the most current four months of messages are displayed on the loading page. The older messages are still accessible through a link at the bottom of the page. Thousands of messages are already archived. Stroll through them to see thermographers from all over the world ask questions and find answers about infrared thermography.

Now your page will load faster and you will still have access to all the postings from 1997 on. You can go to <<http://www.snellinfrared.com/messageboards/index.asp>> and enjoy the Messageboards as hundreds of others already are. We hope you enjoy the community created on the web by Snell Infrared—the leader in infrared education and certification of thermographers!

You can reach *Think Thermally*® at:

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E-mail:
<thinkthermally@snellinfrared.com>
Web Site: <<http://www.snellinfrared.com>>



Infrared camera tip of the day:

After using your camera outdoors in cold weather, expect that it will "fog up" when you come inside, especially if the inside air is at all moist (such as in a paper mill or drying area). In severe situations, consider sealing the camera in a plastic bag before you bring it indoors. This will dramatically reduce the amount of condensation that can occur and possibly do some damage, especially to the inside of the camera and lens. If you plan to continue using the camera, leave it in the bag until it is warm. Use a thermally transparent bag and you can even use the camera while it's still in the bag!

(*Thermal Solutions®*, continued from page 1)

reception and a gallery of over one hundred thermal images shared by many of those attending. The images were excellent, and those by Greg Stockton, Bob Melia and Bobby Fogle were honored as "Best of the Conference."

Lois Broeker (DuPont Niagara) presented images she had taken of animals in local zoos. Lois did a great job of keeping people guessing and warming them up for a remarkable presentation by Dr. Michael Walsh, Director of Veterinary Operations at SeaWorld.

Dr. Walsh showed his use of infrared thermography in SeaWorld's animal care operations.

Thermal images of killer whales holding their mouths open while Dr. Walsh checked tooth infections left attendees with their mouths open!

Small soft tissue injuries, common among many animals, were difficult to see visually but stood out clearly in thermal images. Dr. Walsh continues to pioneer efforts among veterinarians to utilize the technology for care of both large and small animals.



Dr. Michael Walsh



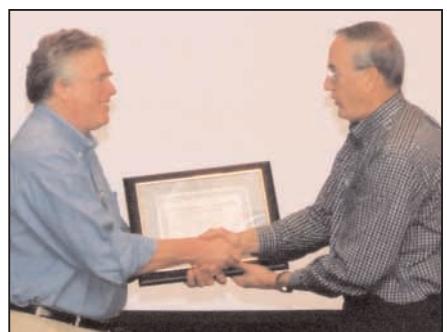
Deborah L. Grubbe P.E.

Twenty-four papers were presented by practicing thermographers, and others in the industry, representing a wide variety of IR applications. Presenters covered subjects such as cost savings, certification, archeology, maintenance and much more! This diverse range of topics offered conference attendees the opportunity to increase the value of their own infrared programs. If you did not attend Thermal Solutions®, the paper presentations are available on paper or CD-ROM.

Each day started with a keynote address. Deborah L. Grubbe P.E. of DuPont spoke about the pioneering work her company continues to do. DuPont's "Goal of ZERO" program is in place to make the workplace safe. Dave Timmerman of Separation Technologies, Inc. talked about mergers and acquisitions in the global economy and

the role thermographers can have in helping secure their company's future. A high point for many at the conference was hearing Thursday's keynote speaker, Rick Searfoss, an astronaut who has traveled to space three times, including a docking

with the MIR Space Station. He was very clear with the valuable role infrared plays both in operations maintenance and the actual mission of imaging the planet from space.



John Snell and Dave Timmerman



Rick Searfoss

Ninety percent of the attendees participated in field trips to Kennedy Space Center and to Underground Disney. The Disney tour provided a look behind the scenes of Orlando's famous attraction. Brook Shafro of Ontario Power Generation declared, "It gave an interesting perspective of Disney I had never seen before on a previous trip."

Planning is already underway for our 2002 Thermal Solutions® Conference, scheduled for January 21–24 in Orlando. We invite you to consider presenting a paper. We'd like to thank all those who attended and helped to make the conference a success. We look forward to seeing all of you next year!

**Visit our website to order the Proceedings,
view our conference photo album or to pick up
a Call for Papers for next year's conference:**

<www.thermal-solutions.org>



Interviews with Thermographers



Recently, we spoke with Tim Miller, a Predictive Maintenance Engineer at South Carolina Electric and Gas Company. He is one of three engineers in Plant Support Engineering at V.C. Summer Nuclear Station who perform predictive maintenance. Tim focuses on thermography and vibration analysis. He collects and analyzes data on rotating equipment. Electrical inspections are conducted by the electricians and analyzed by Tim. Some major findings in the past include flux leakage in the isophase bus ducts, hot spots in the main transformer and an oil-starved bearing on a feedwater booster pump.

This last find was during Tim's first week at a nuclear plant. The imager at the nuclear plant was inoperable, and Tim borrowed a focal plane array camera from another plant. While checking out the camera, he noticed that the outboard bearing on one of four feedwater booster pumps was approximately 60° F hotter than the others. Operations was reluctant, however, to remove the pump from service to troubleshoot the problem. A detailed analysis did pinpoint with relative certainty where the oil flow was blocked. That analysis, coupled with a steady increase in the bearing temperature, convinced Operations to allow maintenance the time to correct the problem. The pump was removed from service, the blockage cleared and the pump was returned to service within six hours. "We were lucky," says Tim, "We did a lot of work on that project, so I don't want to belittle what we did. But there is always a certain amount of doubt until you open up the equipment. The infrared camera is a great tool, but it's not a crystal ball. Management needs to understand that."

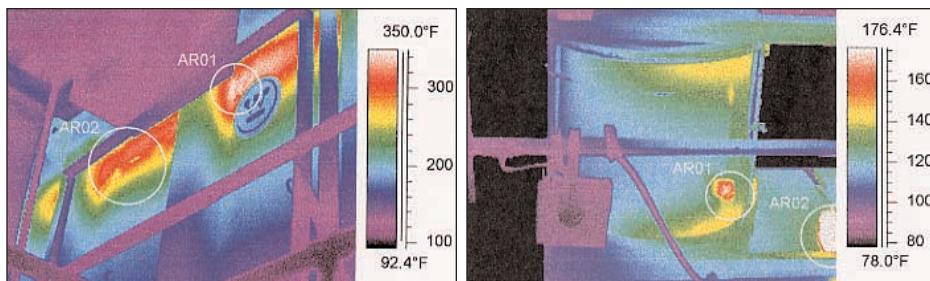
Tim has been working with thermography for over ten years and has been through big changes in the industry. His first imager was a Probeye. Remember

using argon gas? Equipment has changed a lot. More significant than the changes in the equipment, notes Tim, are the changes in the attitude of management. Management's support is critical. After significant investment of both time and money, their program is running well. The biggest drawback of a good program is that eventually there are fewer problems found. "When no problems are being found, management tends to question the need for a thermography program. However, the well-informed, knowledgeable managers understand the need for preventive and predictive maintenance and support it. It's also our job to prove that not finding problems is a good thing." Recently, Tim scanned several valves, looking for a source of air in-leakage in the condenser. No leaks were found, thereby verifying that the valves were not the source of the leakage. "We were able to cross them off our list as a potential suspect for the leaks."

The engineers Tim works with constantly look for new applications and new ways to use their predictive maintenance tools. They combine thermography with other methods: flux monitoring, ultrasonics

justify the use of infrared." The savings from many other discoveries are calculated based on the projected cost of a catastrophic failure and/or in combination with an estimation of the cost of loss of performance and unscheduled maintenance. However, the savings on the roof scan was a tangible amount. From inside the building, the leaks appeared to be extensive. The scan showed that less than 12% of the roof was damaged. The project engineer decided to repair, not replace, the roof. This realized a cost savings of approximately \$60,000.

Tim also believes a good thermographer should constantly be experimenting with the equipment. For example, Tim took the camera home one night to get an early start on a scan at another plant. That night he noticed one of his horses had come up lame. He scanned her leg and noticed a hot spot just above the hoof. After a conversation with the veterinarian, he treated her with Epsom salts at that location. After two days of treatment, an abscess burst through the skin at that location and the horse recovered completely. He has experimented further on horses and found that something



Flux-induced heating on the isophase bus duct of the main transformer

and vibration analysis. Predictive maintenance is discussed, according to Tim, all the time. It was at lunch one day that one of Tim's partners was approached by one of the other engineers with a roof problem. He was in a quandary about replacing or repairing a roof.

Never having done a roof inspection before, Tim called John Snell for specifics, did a little research on his own and mapped out a plan. Two days later, with the engineer in tow, Tim performed his first roof scan. This roof inspection turned out to be what Tim describes as "one of the easiest ways to

not readily apparent can often be found by changing camera parameters, such as level and span, and trying different color palettes. Tim suggests this: A thermographer should have a pretty good idea of what he expects to see. That tip applies not only when the object of his scan is showing up well, but also when it is not.

We want to thank Tim for taking the time to share his experience and knowledge with us. He said he'd share just for the fun of it, but we did send him Vermont maple syrup to make sure it was worth his while! Thanks again Tim, and enjoy those pancakes!



Diana Wright, Registration Coordinator at the Snell Infrared office in Vermont, was lucky enough to get out of the cold in November. She took a well-deserved vacation to Tucson where she visited her daughter Namino and grandchildren Jessica and Nicolas. As the photo so accurately describes, little Nicolas was Thinking Thermally®, along with his big sister and Abuela. Who knows...maybe they've got a future thermographer on their hands? Thanks Diana!



Doug Burleigh was Thinking Thermally® while visiting Vladimir Vavilov in Padova this November. Vladimir, a professor at Tomsk Polytechnic Institute, was staying in this Italian city for two months. He was working with other thermal researchers at ITEF, an Italian institute. According to Doug, there was nothing thermal about the weather: "It was cold! I only took my coat off for the photo." Doug also traveled to Venice and Florence to complete his two-week vacation. Grazie per la fotografia, Doug!

Chris McGrath, of Caraustar Industries, and Mickey Mouse were Thinking Thermally® at Disney World. Chris took a vacation to the Magic Kingdom in November and was fortunate enough to return to Orlando in January to attend the Thermal Solutions® Conference. Because there's so much to see, Chris decided he'd also return to Disney World; he was one of sixty-nine people who chose to go on the Utilidor Adventure at Disney World field trip that attendees were offered on Wednesday afternoon.



Think Electronically!

Due to rising postage costs, we are changing the way we distribute Think Thermally®. We will be sending an electronic version of the newsletter by attachment to e-mail in the near future. There will be no charge to receive the electronic version, but for those

who wish to continue to receive a written copy, there will be a subscription price. To guarantee uninterrupted delivery of the highly-acclaimed Think Thermally® newsletter, please fill out the form below and mail or fax it to us today!

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Certification or certification?

At Snell Infrared, we have long appreciated the fact that two definitions exist for the term certification. In the past, several private training companies did a good job of marketing one of these definitions. They simply declared that people who attended a course and passed a written test at the end were certified. Many people feel this type of certification has some merit. Few would argue, however, that it actually meant the person was qualified. The other definition comes both from Webster and the American Society for Nondestructive Testing (ASNT). It is elegantly simple: "Certification is written testimony of qualification."

We have always issued our students a certificate that "certifies they have completed a training course that complies with the standards of the American Society for Nondestructive Testing (ASNT)." This is essentially the same definition of certification that has been used by other training companies. At Snell Infrared we call this *Basic Certification*. We recognize that it may meet some of our customer's needs for having a credential. Basic Certification is nothing more than written testimony that someone has completed a course. We have always been very careful to remind our customers that Basic Certification offers little assurance that the thermographer is actually qualified. Basic Certification implies mastery of the materials presented in a one-week training course and does not address issues of experience or formal testing.

In this age of high-powered marketing hype it comes as no surprise that some people believe Basic Certification means more than it really does. Others have, perhaps, convinced themselves of the same thing. Thankfully, few thermographers honestly believe that they are qualified simply because they carry a fancy wallet ID card or stamp their reports with a seal that looks remarkably like an engineer's stamp.

While Basic Certification works for some of our customers, more and more industries are finding that

it is simply not enough. For reasons related to safety, regulation or achieving consistent results, many companies must positively prove that their thermographers are fully qualified. How do they do this? By obtaining what we call *Professional Certification*. Professional Certification assumes more than training alone. It is also based on documented work experience and formal certification testing. In short, it is, as defined by ASNT, "written testimony of a person's qualification."

It is fair to ask, "who is ASNT to come up with this definition?" As an independent and respected professional standards organization, ASNT has given us both the definitions and the framework for qualification and certification that have been used for nearly sixty years. In 1992, these standards were adapted specifically for the needs of thermographers. The work of ASNT is critical to the quality needs of the nuclear and petrochemical industries, which gave the Society its start. As defined by ASNT, the three components of certification are training, documented experience and testing. Exactly how certification happens is detailed in their document, *Recommended Practice No. SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing*.

Since SNT-TC-1A is a guideline, rather than a standard, companies can modify it to be a custom Written Practice that meets their specific needs. This means the exact number of months of work experience or the exact form of testing, as examples can vary, as long as the intent of the guideline to maintain quality is still met. Think of the Written Practice as the "rule book" for how someone is qualified and certified within a company.

Which companies will benefit from Professional Certification? Those needing to comply with OSHA 1910 or ISO 9000, or those needing the assurance of consistent, high-quality inspection results. Shouldn't

that be the goal of all thermographers and their companies? Thermographers in the power industry, particularly the nuclear side, may need to have Professional Certification in order to qualify for insurance credits. The insurance companies do not recognize Basic Certification as adequate. Consultants competing for these types of accounts, or those who want to measurably demonstrate they are qualified, should also consider Professional Certification.

The Level I and Level II training courses offered by Snell Infrared fully comply with ASNT standards. This means that completing our training fulfills one of the three elements for Professional Certification. The same is true of most (but not all!) other training vendors.

After completing your training, it is vital to document your work experience. This is a simple matter of keeping a contemporaneous record of your IR-related activities. ASNT suggests three months full-time experience for Level I and eighteen months* for Level II; however, this can vary depending on the needs of the company as stated in their Written Practice.

The final component of certification is completion of a certification exam. Again, look to SNT-TC-1A for minimum exam requirements. These include a number of questions, the types of questions, and the method of generating and administering the exam. Snell Infrared has developed exams that fully comply with ASNT guidelines. These are available to anyone regardless of whether or not you have taken one of our training courses. We've gone to great lengths to make sure these exams—and all the associated records—will stand up to the rigorous audit process of a quality inspector.

Not surprisingly, many people do not understand exactly who it is that actually certifies them. Many

think that their training company or ASNT certifies. Again, we have the case of two definitions! Some training companies make a big flourish of saying they certify their students, while ASNT has always maintained that the employer does. For a training company to certify that you are fully qualified is not only inappropriate but probably also unprofessional. At Snell Infrared, we work closely with training and personnel departments of a wide range of companies to provide the documentation needed for the company to provide the final certification.

Does the fact that the employer certifies you mean that your certification is no longer valid when you change employers? Yes! Does it mean you must start over? No! You can take the elements of your previous certification with you and, depending on your new employers Written Practice, be certified anew.

So certification is really pretty straightforward—if you understand that there are two definitions. Let the needs of your company and your customers guide you to set up simple systems to actually assure those results. Certification of thermographers is not just a marketing game; it is a serious business investment that demands a return.

The bottom line is your thermographers provide data that can literally save you millions of dollars. If they are not actually qualified, they can just as easily cost you millions, or worse, maybe someone's life. Rather than getting caught up in the jargon, get qualified and be able to prove it with a certification program that works.

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*The experience requirement for Level II has been changed to twelve (12) months in the latest version of SNT-TC-1A, 2000 which will be published in March 2001.