

How a modest Seattle infrared company created the IR program model adopted by leading Fortune 500 companies.

Ford Motor Company, General Motors, Cargill, U.S. Steel, Bruce Power, Arkansas Nuclear, Southern Company, Hawaiian Electric... all take their lead from Colbert Infrared Services, Inc.

By Tom Bridgestone

"It all started out simply enough. Who would have known that our company would become the role model on which other in-house IR programs would be based?" Fred Colbert, Colbert Infrared Services.

Back in the late 1970's when Fred Colbert was providing thermographic inspections for the U.S. Navy aboard aircraft carriers at sea, each survey would take approximately two weeks to complete.



At that time each step was paper-based: the routing; the inventory of what equipment was to be tested or not tested; the documentation (images and temperature data) of new problems; the reconciliation of past problems; and the prioritized lists of the findings.

To do the job right required having all of the previous inspection data in the field for the thermographer to review in order to follow up on past problems and document new ones. It was often necessary to carry over 10 pounds of paper (including past reports and paper forms) into the field each day just to be able to gather accurate data for the current inspection. Countless hours were spent each day writing down the information on paper forms, and later having to retype the same information to create the report.

Although the paper-based solution was cumbersome, the principle of accounting for each piece of equipment over time, and trending the performance of a site over time was an idea whose time had come. Infrared thermographic inspections now had a solid

foundation from which higher quality testing procedures and data collection could follow.

In the 1980's with the introduction of portable computers and database software, Colbert Infrared Services started integrating their proven testing procedures with methods of automated data collection and office automation.

Fred Colbert created a database program called Thermal Trend, which was modeled from the way thermographers work while performing their inspection in the field.

Thermal Trend was structured so that the thermographer had just the right critical information when and where he needed it.

Key features:

- Eliminated the necessity of taking all of the past paper reports out into the field.
- Improved the quality of data by reducing clerical errors caused by re-entering data from paper forms.
- Eliminated the need of typing up reports after the inspection was completed.
- Freed the technician to put more emphasis on the thermography, instead of the administration.



Initially, thermographers carried the first "laptop" computers to the site. These "laptops" weighed 10 – 15 pounds. The introduction of Pen Tablets (at 3 pounds each) in the early

The Thermal Trend Database and Pocket PC for Infrared Inspection Programs



1990's was a great help, but also required the technician to carry around extra batteries, a charger, an external keyboard, stand, etc. With the developments in the Pocket PC in 2002, it was time for another leap forward. The small, light-weight Pocket PC completely eliminated the mobility constraints of the Pen Tablets.



Fred Colbert went back to the drawing board and completely redesigned the Thermal Trend database to take advantage of the benefits that the Pocket PC platform provided. To that end, he took all of the lessons learned from past versions of Thermal Trend and started over. First, he redeveloped Thermal Trend for the Pocket PC platform and then migrated the application back over to the desktop. This approach gave full advantage to the strengths of both platforms, the Pocket PC and the desktop.

"We have ensured that the same accountability for data collection and testing procedures that we developed back in the 1970's and in previous versions of Thermal Trend continue to provide a solid foundation for utilizing Thermal Trend on the Pocket PC. We have really focused on the user interface to allow the thermographer to integrate data as conditions suggest, rather than being forced into entering data in only one way."
Fred Colbert

Building on proven success

Building an Infrared Inspection Program from the ground up can be overwhelming. Apparently this is the reason that companies like General Motors, US Steel, Southern Company, Bruce Power, and Hawaiian Electric to name some, are modeling their IR programs after the testing methods and data collection procedures that were established by Fred Colbert. They are using Thermal Trend and the Colbert model as the established platforms for exploiting the gains Thermal Trend has made in data handling, collection, automation, and accountability.

Benchmarks, Perspective and Legacy: The longevity of a paper-based or "flat" electronic Infrared Inspection Program is 3 to 5 years. At that point it would generally need to be started over from scratch. There would just be no way to build on what had taken place before without a system to ensure the accuracy and repeatability of the prior data or without establishing sound testing procedures that could be easily replicated by the next thermographer.

A key aspect of Thermal Trend is that it establishes a solid point of reference for a facility's Infrared Predictive Maintenance inspection program. Thermal Trend's focus is on providing both short and long term perspectives of a facility's reliability based on high quality, repeatable data.

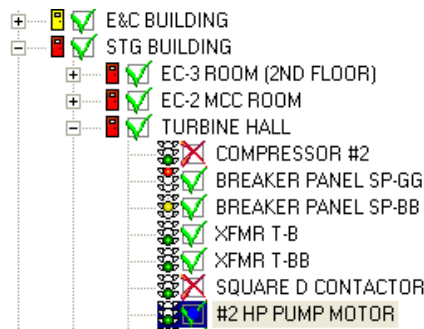
Fred Colbert likens the effectiveness of the Thermal Trend database system to a relay race. Thermal Trend allows the data from prior inspections to be easily handed from one thermographer to another, much like relay-runners passing the baton without dropping it. Most companies do not have a system in place to ensure that the data from past inspections is being checked against the current one. This creates serious omissions in the accountability and accuracy of their inspection program – akin to dropping the baton and having to start back at the beginning.

"Thermal Trend allows us to build on all of the previous inspections. We can hand over the baton (Pocket PC) to the next guy to keep on running without missing a step. This has provided us with the ability to provide world class service to our discriminating clients who need the highest level of quality information on which to base their decisions. After all, it's the quality of the information that they are really paying for. Missing just one problem can cost them hundreds of thousands of dollars. It's all about keeping your eye on the baton. Having a system in place that provides you with what is to be tested, has been tested, problems, trending of past problems etc. That is what it is all about." Fred Colbert

Thermal Trend database and the Pocket PC are appropriate for the following types of inspections:

- Electrical equipment
- Mechanical equipment
- Refractory
- Roof moisture inspections
- Building envelope integrity
- Visual inspections
- UV Corona discharge

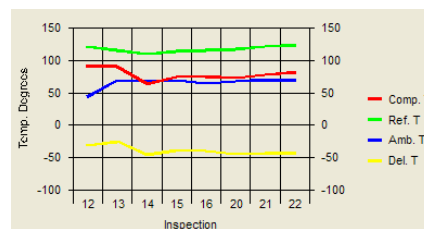
Route-based hierarchy of equipment to be tested makes data entry easy by using bar codes, GPS and CMMS asset codes. Smart Icons clearly illustrate problem conditions.



Prioritized lists of problems can be filtered by location or equipment name in order to immediately identify problem conditions.

Comment	Ins.	Date	Type	Item #	Delta T
Problem #27: A...	22	1/29/2001	Thermal	27	308
Problem #18: Fa...	22	7/25/2002	Thermal	18	185
C, B, & A phase...	20	2/4/2002	Thermal	6	170
C Phase line sid...	20	1/29/2001	Thermal	61	159
Problem #40: C...	22	3/5/2003	Thermal	40	157
Problem #05: C...	22	3/5/2003	Thermal	5	142
Problem #13: B...	22	3/5/2003	Thermal	13	141
Problem #41: C...	22	7/19/1999	Thermal	41	140
Problem #29: B...	22	3/5/2003	Thermal	29	136

Historical Trending of problem conditions over time provides valuable insight into problem status.



Detailed information about every problem condition includes Thermographic images, photos, voice annotations and attachments.

Repair Scheduling and Tracking offers a mechanism to track every anomaly as the problem condition is rectified.

CMMS and MS Office Integration: Thermal Trend data can be easily exported to Microsoft Office programs and imported to CMMS Programs like MAXIMO.

Advanced Reporting: The Desktop and the Pocket PC synchronize to each other facilitating comprehensive report generation.



A successful inspection program today still requires professionalism on the part of the technician; accounting for every piece of equipment; and, reliable data. The Thermal Trend database system and the inspection procedures developed by Fred Colbert are important pieces of this program, as can be seen by the increasing number of quality organizations adopting the Colbert model.



Thermal Trend

Thermal Trend is sold and supported by the Professional Thermographers Association.



For further information please contact your authorized Thermal Trend Sales Representative in your area. www.ThermalTrend.com



Colbert Infrared Services, Inc.
IR Thermal Trend PdM Inspections, Training, Equipment Sales

Colbert Infrared Services
2014-A East Union Street
Seattle, WA 98122
Phone: (800) 800-8178
www.Colbert-Infrared.com
IRinfo@Colbert-Infrared.com

Tom Bridgestone is a technical writer based in Seattle.