MEETING MINUTES FROM THE TWENTY-FIRST IRUG MEETING

The twenty-first IRUG meeting was held from July 13 to July 15, 2011 in Albuquerque, New Mexico, at the Hyatt Regency. The following notes summarize the presentations and discussions from the meeting.

Wednesday July 13, 2011

Introduction
EPRI IRUG Project Manager, Gary Noce, opened the meeting and introduced the IRUG Chairperson Eric Sorg who welcomed everyone to Albuquerque for the twenty-first IRUG Meeting and went over the schedule for the week.

Attendee Introduction
The attendees introduced themselves and noted the company they work for, responsibilities, and thermography background.

The Vendor Show
The Vendor Expo was held Tuesday evening, and Wednesday. Participants included

- UE Systems Inc
- SKF Condition monitoring and Reliability Systems
- PDMA Corporation
- Vibro-Meter Inc
- Logos Computer Solutions
- Stress Engineering Services
- Hydro Inc
- Siemens Energy, Inc
- Polytec Inc
- Infraspection Institute

Gary Noce - EPRI IR Severity Criteria Project Update
The IR Severity Criteria Project software has been moved into production and the participating utilities have started to input data. This presentation was an overview and update which included screen shots of the different tabs in the software used for data collection. The objective of the project is to develop specific severity criteria for individual pieces of equipment. Discussions took place on how this can be a training venue for new IR Thermographers with the database of anomalies. The severity criteria is a topic that has been discussed at recent IRUG meetings. At the time of the presentation there is still a need for more participation from utilities.

Jim Seffrin – Infraspection Institute – Techniques for Accurate Temperature Measurements
While most infrared instrumentation is relatively easy to operate, accurate temperature measurement depends upon proper selection and use of the instrument as well as instrument calibration. This presentation focused on several key issues affecting the accuracy of radiometric temperature measurements and suggestions for reducing errors. Most radiometers do not require contact with the object being measured. Radiation thermometry is subject to several error sources not associated with contact thermometry, common error sources include: emissivity, spot measurement size, environment, equipment capabilities and equipment calibration, Failure to address one or more of these errors sources can lead to significant errors.
Things to be aware of: error sources can cause significant inaccuracies, Infrared temperature measurement is both art & science, IR temp measurement is not ‘Point and Shoot’ and accurate readings are possible with proper equipment, techniques, and trained operator.

Gary Noce – IRUG Roundtable discussion on EPRI IR Documents
This roundtable discussion was centered on the existing IR documents which included IR guidelines. A number of the documents are more than seven years old. The discussion was to determine which of the documents needed to be updated, which should be consolidated and which ones need to be eliminated. The one document that is the newest is the pocket Field Guide: Infrared Thermography for Substations. There was discussion on putting together pocket guides for other applications which include: Medium and Low Voltage Distribution. As the group reviewed the existing documents it was suggested that the first document that should be updated was the Guideline for Developing and Managing an Infrared Thermography Program.

Thursday, July 14, 2011

Jim Seffrin – Infraspection Institute – NFPA 70E – What Thermographers Need to Know
This presentation focused on the history and application of NFPA 70E, changes included in the 2009 edition and how they affect Thermographers. The presentation was not intended to cover all applicable safety standards. It is the individual’s responsibilities to determine applicable safety standards and perform their work accordingly. Most significant revisions include definitions for: Arc Flash Hazard, Arc Flash Hazard Analysis, Arc Flash Suit, Arc Flash Protection Boundary, Limited Approval Boundary, Prohibited Approval Boundary, Restricted Approval Boundary, and Working on Energized Electrical Conductors. The presentation also discussed the general requirements for Electrical Safety – Related Work Practices and the selection of appropriate Personal Protective Equipment.

Jim Seffrin – Infraspection Institute – Temperature Limits for Electrical and Mechanical Equipment
This presentation focused on several ways to set temperature limits for electrical and mechanical equipment along with the pros and cons of each method. Historically, two methods have been established repair priorities for electrical components: Delta T or Temperature Differential and Absolute Temperature. Delta T Method requires a reference temperature, similar component under similar load and ambient air temperature. Four commonly referenced criteria sets used for establishing repair priorities are the InterNational Electrical Testing
Association, Military Standard, Experience-based and Motor Cores (on test bench, not in service). There are advantages and disadvantages to the Delta T method. The Absolute Temperature Method is based upon research conducted by Factory Mutual in 1990. Temp limits assume 100% load at a specific ambient temp. Just like Delta T the Absolute Temperature Method has its advantages and disadvantages. Mechanical systems require more frequent inspections than electrical systems. Applying temperature limits to mechanical require establishing inspection frequency, set temp limits, trend measurements and analyze when alarm limit is exceeded. In addition to temp limits, consideration must be given to the importance of the subject component to the safe and continued operation of the facility. Setting temperature limits priorities involves a degree of risk management.

**Tom Frail - Con Ed – Online Infrared Monitoring of Substation Equipment**
The presentation covered the collaborative project between Con Ed and EPRI, the overview involves installing a network of cameras to monitor the sites. The online IR system provides the engineer with early warning. The engineer can evaluate and trend the situation with time. EPRI will develop algorithms following an open-source approach for automatic real-time adjustment of camera parameters for accurate IR measurements, for detection and characterization of high-voltage substation equipment, to account for environmental conditions and equipment specific parameters and to serve as guidelines for online fault detection, classification and diagnosis. The project is divided into phases.

**Phase 1:** Proof of Concept in Laboratory
**Phase 2:** Deployment in Con Ed Substation
**Phase 3:** Data Gathering & Algorithm Refinement

New utilities are encouraged to participate in order to strengthen the collaboration effort.

**Eric Sorg – DTE Energy – Infrared Program Fundamentals Mentoring**
The presentation was a follow up to last years New Member Mentoring Session, focused on a new member mentoring session which involves the self proclaimed “greybeards” of the group gathering and allowing their brains to be picked by the new members of the group. This method has shown to be effective in the past. DTE uses a self assessment is used to gauge the effectiveness of the IR program on a unit/site/company level.

**Phil Schell – Lincoln Electric System – What’s the Temperature**
The presentation was focused on IR and pad mount transformers. Scanning the transformers with IR to determine if there is an anomaly, determine the temperature when looking at the fuses and other aspects to take into consideration when looking at pad mount transformers

**IRUG Business Meeting**
The IRUG business meeting was held with only utility and EPRI personnel in attendance.

**New Business**
The election of officers for IRUG 2012 was conducted with David King (APS) elected as Vice – Chairperson, John Pace (Entergy-Northwest) the 2011 Vice-Chairperson will move into the Chairperson. Congratulations to David for being elected as an officer.

There were discussions on a number of topics which included conference calls with the officers during the next months and also with IRUG 2011 attendees on getting things started for IRUG 2012. Topics for presentations and workshops for next year and also working to get the new IR technicians at the facilities involved in the IRUG meeting
Potential Training/Presentation Topics 2012

- IR windows
- Updates on safety and IR
- New IR equipment
- Certification process
- IR being used in different applications (outside utility industry) possible medical etc.
- Implementation of an IR program
- More case histories

The IRUG 2011 Business Meeting was adjourned.

**Winner of the Travis Roseman Memorial Award**

Phil Schell (Lincoln Electric System) was the recipient of the Travis Roseman Memorial Award for his presentation on *What’s the Temperature.*

Congratulations Phil!

Open Round Table Discussion by attendees on IR related issues.

**Friday, July 15, 2011**

**Gary Williams – STP Nuclear Operating Company – Circuit Breaker**

This presentation was on a circuit breaker that flashed when it was racked in.

**John Ogren – GenOn Energy Inc. – IR Anomalies and Case Histories**

This presentation was focused on a variety of thermal anomalies that were found during routine IR surveys.

Open Round Table Discussion by attendees on IR related issues.

Eric Sorg closed the meeting with a thank-you to everyone in attendance and also commented on keeping in touch throughout the year.