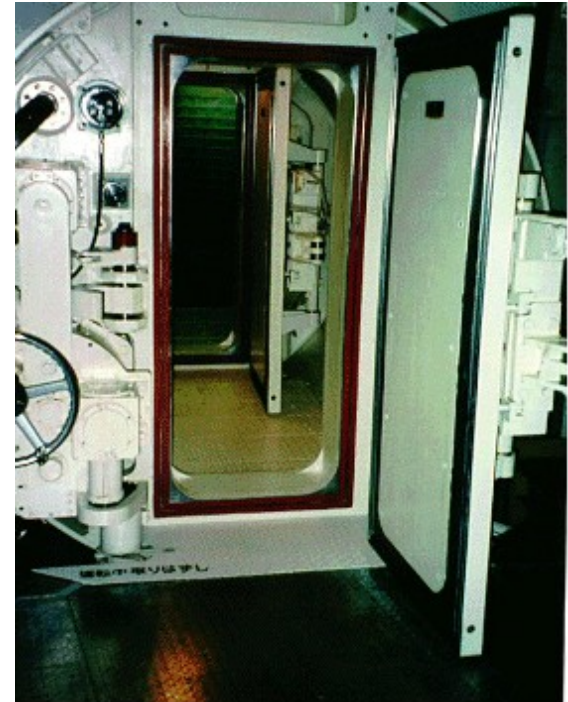
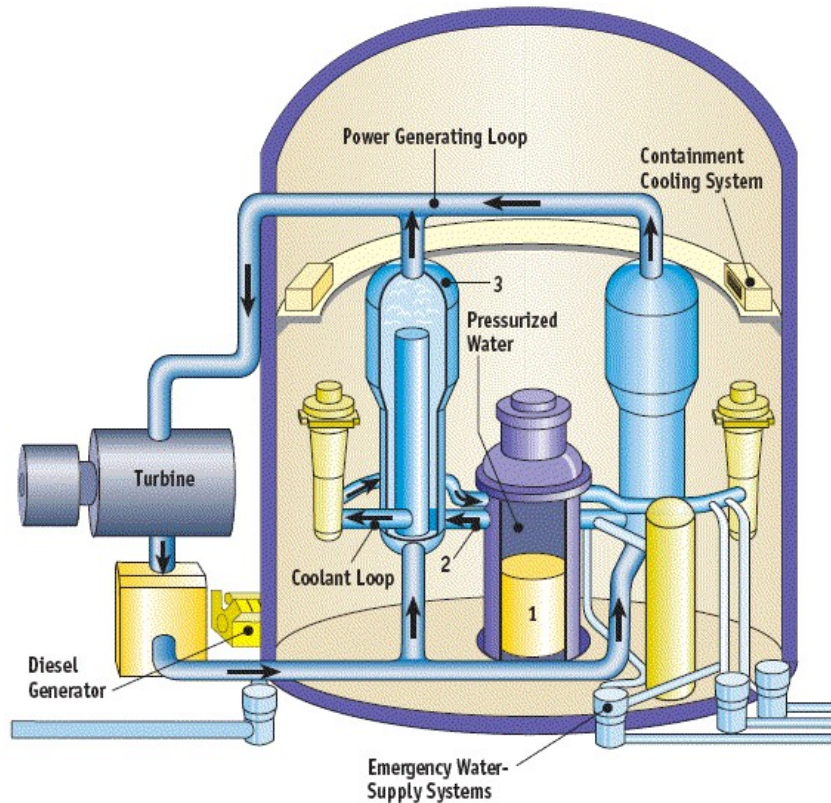




Graftel ILRT Services



About Graftel

- Graftel is a specialized calibration and services company located outside of Chicago Illinois.
- For over 14 years, Graftel has serviced the nuclear power community.
- Graftel's specialty is in containment leakage rate testing, calibration, and instrumentation design.
- We run a full service liquid and gas flow, humidity, temperature and air velocity calibration facility along with engineering design services.
- We currently work with most of the Nuclear Facilities in the continental United States as well as plants in Korea, Japan, Brazil, and England.



QUALITY ASSURANCE

- Graftel, Inc. maintains a QA program that meets the requirements of 10CFR50 Appendix B, 10 CFR 50 Part 21 as well as ISO 9002 and ISO 17025.
- All calibrations are performed in compliance with both ANSI/NCSL Z540-1-1994 and ISO 17025-1994.
- Our last audit was performed by the Washington Group during the 2nd quarter of 2004 for ILRT work Graftel is performing at Turkey Point.
- Graftel is listed in the NUPIC database as a calibration, software and engineering consulting supplier.
- The previous NUPIC audit took place in November of 2002
- Duke Energy is conducting a new NUPIC audit of our calibration, software and ILRT services in November of 2005.

Graftel is Certified by L.A.B. as an ISO/IEC 17025:1999 Compliant Calibration Laboratory



Laboratory Accreditation Bureau

Certificate of Accreditation

ISO/IEC 17025:1999

Certificate Number L2115

Graftel, Inc.
5050 Newport Drive, Suite 7
Rolling Meadows, IL 60008

has been accredited for technical competence in the major fields and related disciplines on the approved scope of accreditation. They have met the requirements set forth in L-A-B's policies and procedures, and all requirements of ISO/IEC 17025:1999 "General Requirements for the competence of Testing and Calibration Laboratories."

Accreditation effective March 28, 2005 and valid through March 28, 2008

Peter B. Lake
Executive Director

R. Douglas Leonard, Jr., Chief Technical Officer
Laboratory Accreditation Bureau

Graftel's Scope of Accreditation

- Liquid Flow
- Gases Flow
- Velocity
- Temperature
- Relative Humidity
- Dew Point temperature



Certificate # L2115

Scope of Accreditation For Graftel, Inc.

5050 Newport Drive, Suite 7
Rolling Meadows, IL 60008
James Glover
847-398-5100

In recognition of a successful assessment to ISO/IEC 17025:1999, accreditation is granted to Graftel, Inc. to perform the following Calibrations:


Accreditation granted through: **March 28, 2008**

Calibration

Calibration Parameter/Equipment	Range	Best Measurement Capability (+/-)	Remarks
Temperature	-100 C to 180 C	0.023 C	Temperature Baths PRT
Gas Flow Rate	1 sccm to 24 slm	0.28% of reading	Flow Tubes
	24 slm to 1500 slm	0.21% of reading	Sonic Nozzles
Relative Humidity	1 % RH to 60 % RH	0.5 % RH	Chilled Mirror Hygrometer PRT
	61 % RH to 95 % RH	1.0 % RH	
Dew Point Temperature	-80 °C to 20 °C	0.22 °C	Two Temperature Generator PRT
Liquid Flow Rate	1 ccm to 300 lpm	0.06 % of reading	Weighing Method
Air Velocity	2 m/s to 50 m/s	0.5 % of reading	Wind Tunnel Pitot Tube

Notes:

- 1) Best Measurement Capability represent expanded uncertainties at approximately the 95% confidence level using a coverage factor of k=2.

Approved by:  Date: September 22, 2005

R. Douglas Leonard
Chief Technical Officer

Issued: 4/05/05
Revised: 09/22/05

Form 28.8—Rev 6 June 10, 2003

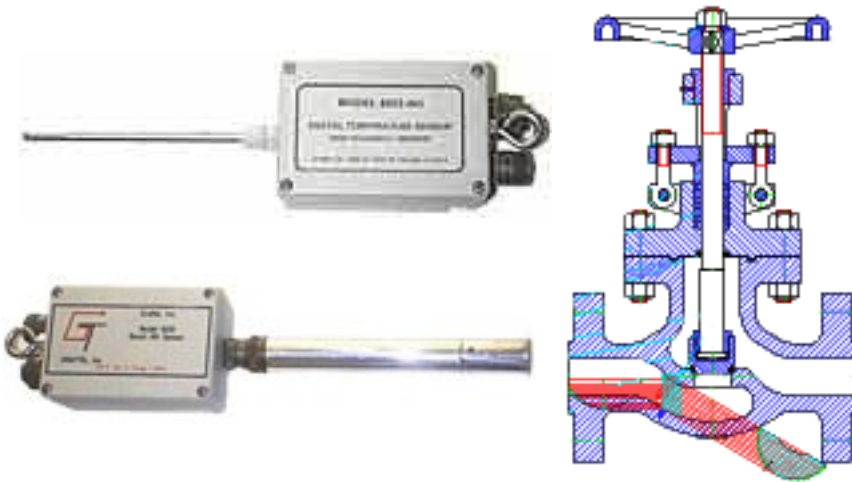
Page 1 of 1

INDUSTRY HISTORY

- Graftel is a supplier, designer and manufacturer of ILRT equipment and software.
- This equipment and software has been used in more than 100 ILRT's.

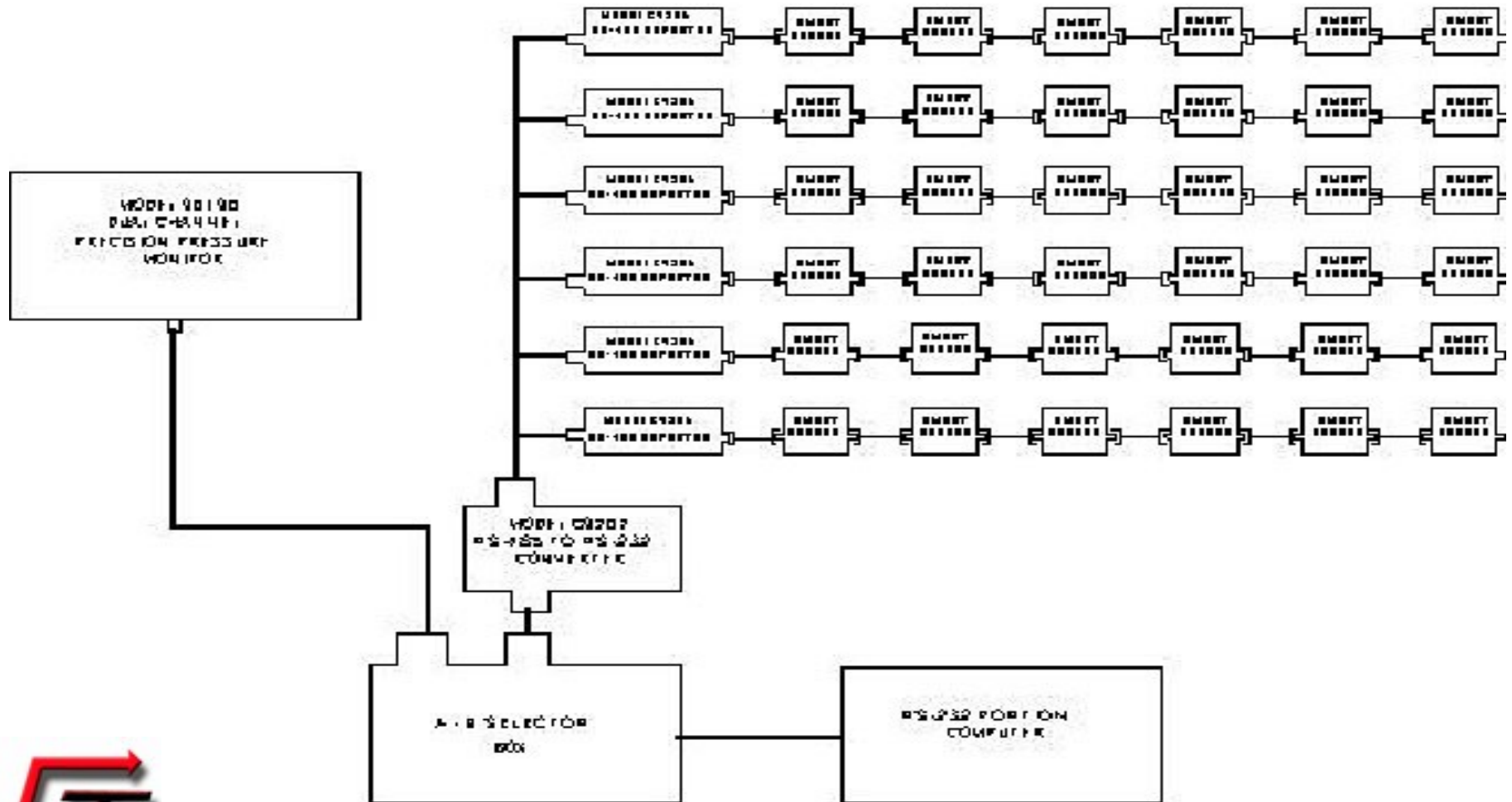
The following plants are a few of those in the US and Korea that have used Graftel's ILRT system:

- **Surry**
- **North Anna**
- **Dresden**
- **Quad Cities**
- **LaSalle**
- **Byron**
- **Braidwood**
- **TVA - All Sites**
- **Duke Energy – All Sites**
- **River Bend**
- **Omaha Public Power District**
- **Pacific Gas & Electric**
- **Southern California Edison**
- **Public Service Gas & Electric**
- **Texas Utilities**
- **Union Electric**
- **Nebraska Power & Light**
- **Calvert Cliffs**
- **Turkey Point 3 & 4**
- **All KEPCO nuclear plants in South Korea**



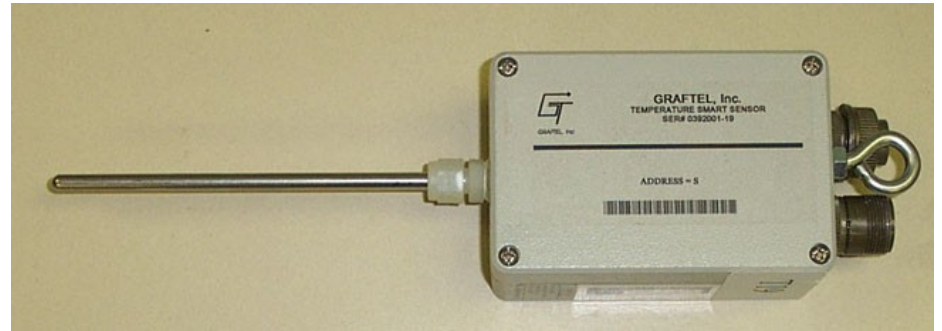
In 1993 Graftel Developed the Sensors and System Now Used for ILRT's in the US and Korea

TYPICAL SMART SENSOR ILRT INSTRUMENTATION SYSTEM



Graftel ILRT Sensors

**Graftel Model 9202 ILRT
Temperature Sensor**



**Graftel Model 9203 ILRT
Relative Humidity Sensor**



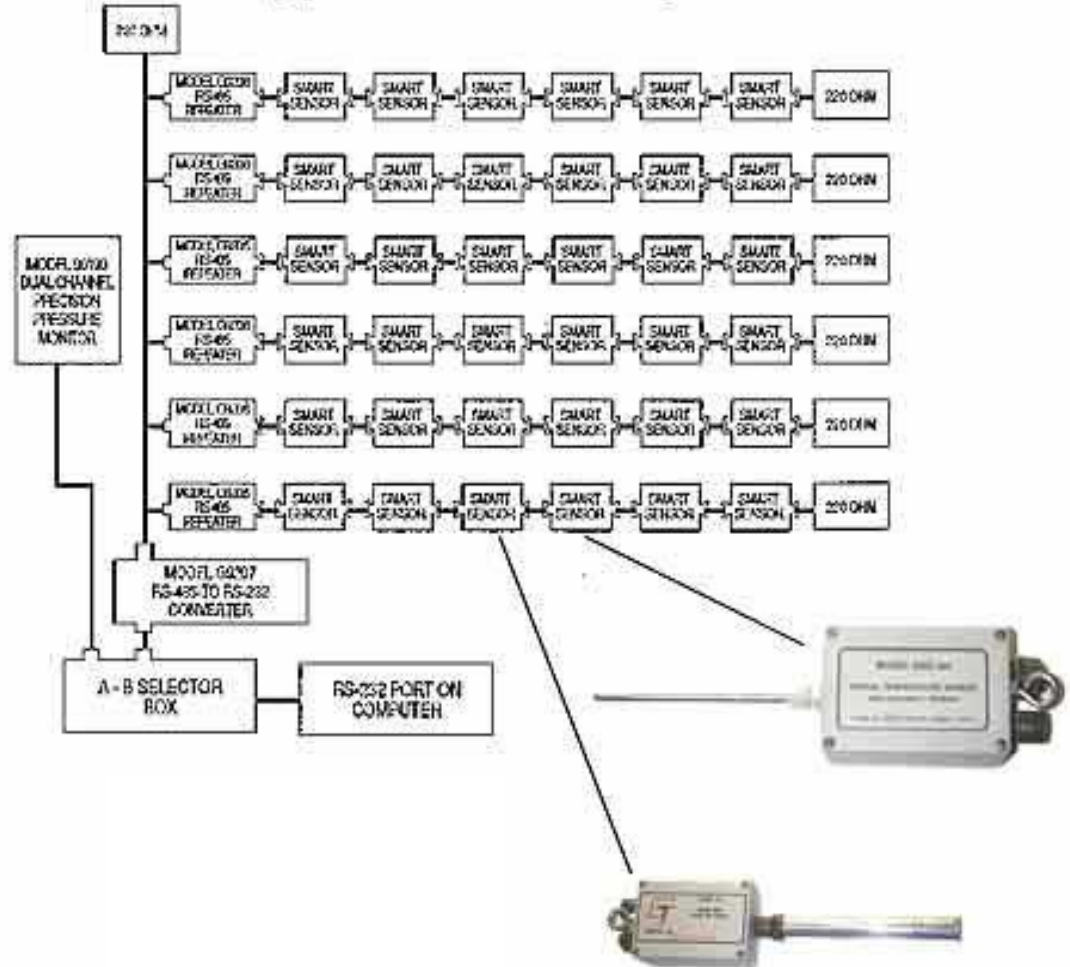
ILRT Pressure Transmitter



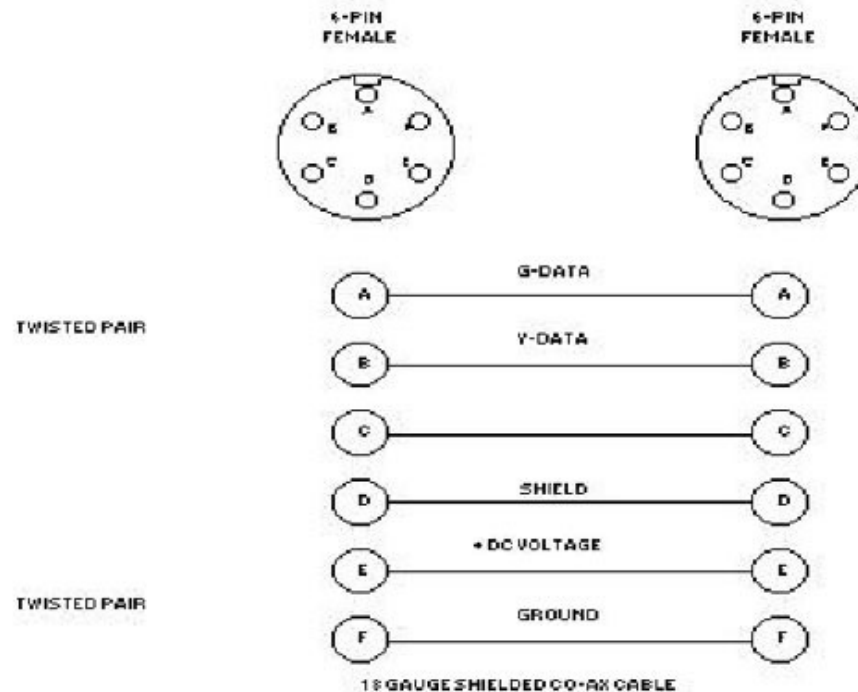
ILRT Cables



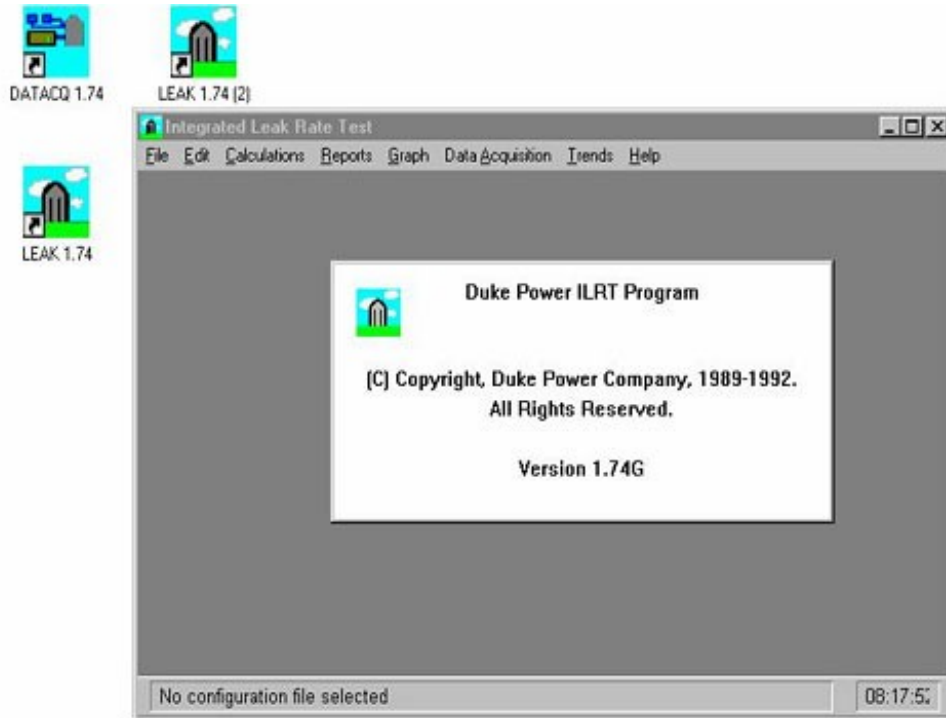
Typical ILRT System



Model 9202 and 9203 Smart Sensor Cabling Layout



ILRT Software



- The Duke Power ILRT computer code will be used which has full verification and validation.
- This software has been used in over 70 ILRT's.
- The interface will be a standard PC supplied by Graftel with all required preinstalled, documented and benchmarked under the Graftel software QA program.
- This software performs all data collection and analysis in accordance with ANS 56.8-1994.
- The software supplied is maintained, installed on the PCs and benchmarked by Graftel under a software QA program which has been audited and documented as acceptable by a recent NUPIC audit.

Level III Personnel

Jim Glover

M.S. Mechanical Engineering, Illinois Institute of Technology

B.S. Energy Engineering, University of Illinois

Graftel Inc., 2001 to *Present*

Exelon 1985 to 2001, Station Technical staff and Corporate ILRT coordinator

- Performed over 60 ILRT's at both PWR and BWR plants
- Designed Digital ILRT and SIT Instrumentation Systems
- Performed Appendix J design basis reviews and program reviews at over 20 nuclear plants.
- Taught ILRT and LLRT seminars since 1991 in the US, Taiwan and Korea
- Current Chairman of the ANSI/ANS-56.8 National Standards Committee for Containment Leakage Rate Testing
- Representative on the Boiling Water Reactor Owners Group Containment Testing Subcommittee for Containment Leakage Rate Testing
- Member of NEI advisory committee on Appendix J leakage rate testing
- Facilitator for Appendix J Users Group, APOG



Level III Personnel

Babul Patel

Ph.D. Engineering, University of Nebraska, Lincoln

MS Chemical Engineering, University of Nebraska

BS Chemical Engineering, Indian Institute of Technology, Bombay, India

- As supervisor of the Bechtel Surveillance Test Group, participated in over 30 containment ILRT's, 15 SIT's and numerous pre-operational LLRT's.
- Registered Professional Engineer, State of California
- Professional Chemical Engineer - Registration - CH 3995
- Professional Mechanical Engineer - Registration - M 27932
- Member, American Society of Mechanical Engineers
- Member, American Institute of Chemical Engineers
- Member, ANSI/ANS Committee on ANSI 56.8 Containment Leakage Testing Requirements

Level III Personnel

Ken Clark

BSME - University of Arkansas

- Managed the Containment Integrity Testing Program for the Tennessee Valley Authority (Nuclear)
- Coordinated plant operations, maintenance, and engineering personnel during major plant preoperational and inservice: over 40 outages experience.
- Developed the site-specific primary containment integrity test implementing procedures for local leak rate and integrated leak rate testing at all TVA nuclear sites.
- Wrote, performed, and directed containment local and integrated leak rate tests (Directed and performed over 30 CILRT's).
- Active Member of ANS/ANSI 56.8

Mark Hutchinson

BS, Mechanical Engineering, University of South Carolina

- Duke Energy Senior Engineer 1987 – Present
- Performed over 25 ILRT's

Level II Personnel

Roger Anderson

University of Wisconsin: B.S. Mechanical Engineering

Loyola University of Chicago: MBA

- Graftel, Inc.: 1991 to Present
- Presray Corporation: 1988 to 1998
- Graftel QA Manager and has provided Instrument support for over 10 ILRT's

Scott Pickett

Mike Rodriguez

Approach to Work

Graftel Provides many options for degree of support for the performance of an ILRT.

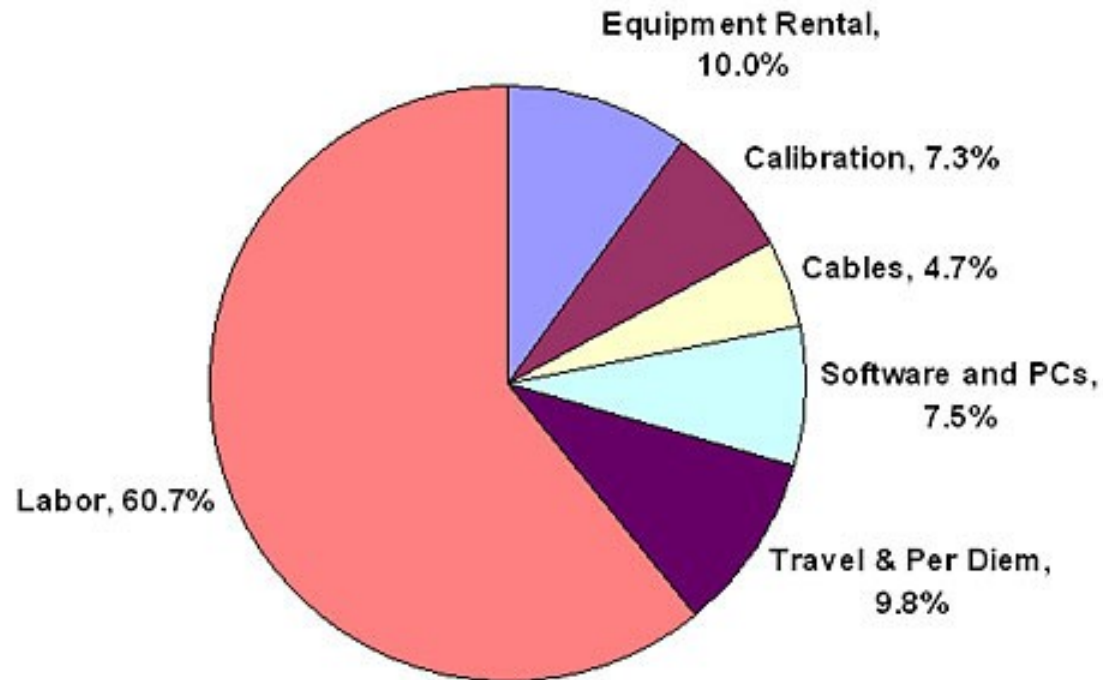
1. Turn-Key ILRT
2. Everything Except the Compressors

Typical Subtractions

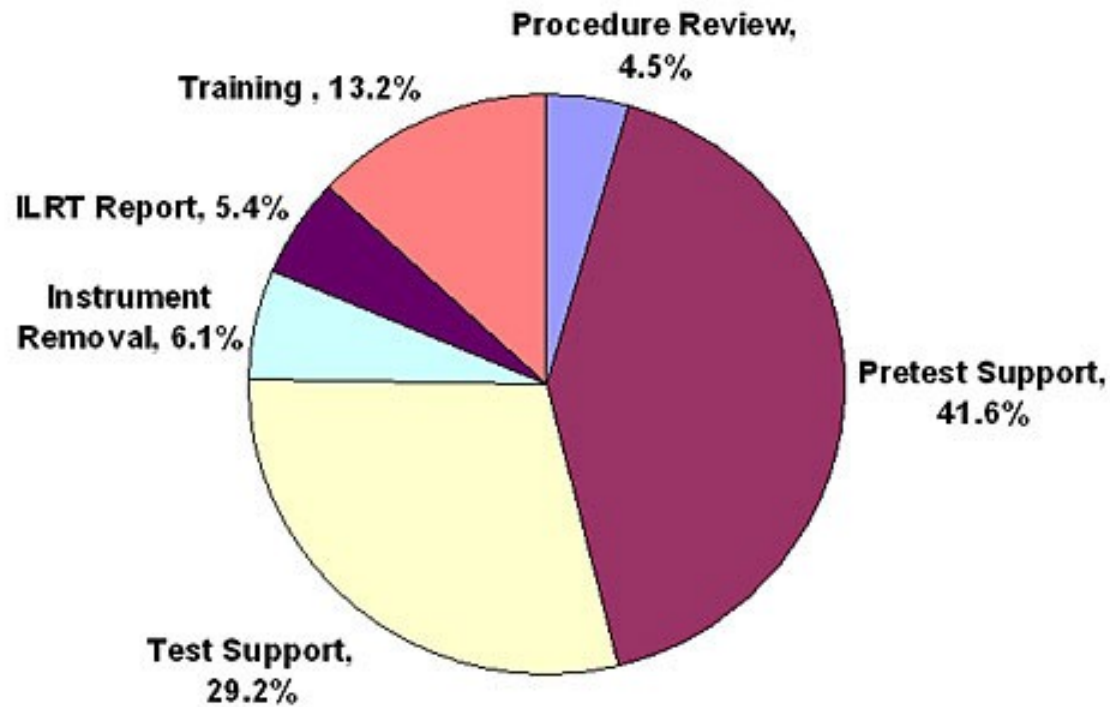
- Technical Support
- Instrumentation and software
- Calibration
- Cables



Typical ILRT cost breakdown



Typical ILRT Labor Cost Breakdown



Pretest Support

The “Kick-Off” Meeting

Upon award of the contract the first step is to conduct a kick-off meeting.

At this meeting which takes place on the customer’s site, the below tasks are addressed:

- Introductions between Graftel and site personnel
- Meeting to insure a thorough and early understanding of the site’s objectives, constraints and special needs
- Acquisition of plant procedures, drawing and other information
- Acquisition of information concerning previous ILRT’s performed on the site
- Planning of training required for subsequent unescorted plant access
- Walk-down of accessible plant areas where the test will be conducted, this provides the information required to make cables and set-up instrumentation system
- Formulation of a plan and schedule for testing and support

Procedure review

The information collected at the kick-off meeting shall be utilized to review the site’s existing ILRT and associated procedures.

Procedure reviews always performed by a level III test engineer. Graftel supports whatever number of iterations required to achieve an excellent final procedure for use.

Pretest Support

Testing Improvement Review

Graftel reviews the previous ILRT's conducted at the site. The objective of this review:

- Identify opportunities to enhancement technical performance
- reduce the testing time required.

This review includes:

- a detailed review of the plants volume fractions for sensor locations and assigned weighting factors
- examination of the pressurization techniques and times required, assessment of time verses cost of addition compressors
- review of the temperature stabilization history. Recommendations for improving the stabilization by better controlling the air delivery and control will be made to reduce the stabilization required.
- review of thermal stability and water levels of plant systems during performance previous tests. Recommendations to improve this stability and thus reduce Type A testing time will be made.
- review of the blow-down rates and methods to decrease the time required for depressurization



Pretest Support

A formal report is issued which lists:

- Specific areas for improvement
- Resources required
- Potential savings which may be achieved



Pretest Support

Equipment Calibration and Staging

- The equipment calibration and staging that takes place at the Graftel labs prior to the test are described in the steps below.
- Based upon plant walk downs during the kick-off meeting visit and the final test procedure, instrumentation cabling is fabricated. Whenever possible, the entire cable system is fabricated. This allows for end to end testing in our labs
- All ILRT instrumentation is configured and calibrated within six months of the test start date
- All required software is loaded on the PCs to be used and the software is subjected to base lining and target computer testing
- Based upon the final test procedure, the software configuration file are developed, written and loaded on the PCs
- All instruments are connected to the actual cables to be used in the plant and the entire system is configured and staged in the Graftel labs
- The entire staged system is allowed to run continuously for at least a week. The collected data is examined for accuracy, stability and any spiking.



Pretest Support

Shipping

The complete system instrumentation is shipped to the plant at least five weeks prior to the test.

The below items are included in this shipment.

- all fully calibrated instrumentation
- all instrumentation cables
- all containment sensor cables
- certificates of calibration in a binder for all instruments
- an inventory of all equipment and instrumentation
- the PCs with documentation and software



Pretest Support

Site Equipment Staging

A month prior to the ILRT, the complete instrumentation system complete with cables and PCs are set up in a staging area at the plant.

The entire system is started and data is collected.

The system is allowed to run for two days and the data is later inspected.

This staging provides added and final assurance that the entire system will perform properly.



Pretest Support

System Staging

One week prior to the ILRT, one Level III and one Level II will arrive onsite for training and test preparations. During this time the final test preparations are performed.

This includes:

- set-up equipment in ILRT room or area
- installation of cables outside of containment to the instrument penetrations
- testing of containment penetrations
- installation of instruments inside of containment
- pretest checks of all instruments
- resolution of final procedural items



Test Support

- One Level III and one Level II personnel arrive on-site a week prior to the ILRT
- The other Level II and Level III arrive a few days prior to the test
- Graftel provides 24 hour coverage during the ILRT with a Level III and a Level II personnel on each 12 hour shift
- All aspects of the test procedure, instrumentation and software are supported
- This support continues until conclusion of the test



Instrument Removal

- Containment blow-down
- Containment entry and post test walk-down
- Removal of test instrumentation
- Packing and shipping of instrumentation from containment

ILRT Report

- With-in 24 hours of completion of the ILRT, Graftel provides a summary report to the site of the ILRT.
- This report demonstrates how each acceptance criterion was met and contain all test data.
- The draft of the final ILRT report shall is produced by Graftel and provided to the site for review within one week of test completion.

Typical Project Schedule

Action	Prior to Test
Conduct Kick-Off Meeting	12 Weeks
Complete Procedure Reviews	8 Weeks
Provide Testing Improvement Review Report	8 Weeks
Calibrate and Stage full ILRT system at Graftel Offices	6 Weeks
Ship the entire ILRT system to Site	5 Weeks
Stage System On-Site	4 Weeks
Graftel Arrive On-Site for Training, Set-Up and Support	1-2 Weeks

Typical Test Schedule

Task	Time,(hours)
Bring Instrument into Containment and Install	4
Pressurization	4 to 12
Stabilization	4 to 6
Type A Test	8
Verification Stabilization and Test	5
Depressurization	8

Typical Post-Test Schedule

Task	Time After Depressurization
Removing Equipment from Containment	8 Hours
Publish Preliminary Report	24 Hours
Perform As-Found Calibrations	7 Days
Draft ILRT Report to Site	14 Days
Final ILRT Report	21 Days

Contingency Plans

- Graftel employs four level III ILRT personnel.
- Each of these are capable of directing all aspects of an ILRT.
- Typically two level III's are used for an ILRT and a third is available on stand-by if needed for any reason.
- Graftel employs four level II personnel
- Each of these are capable of providing full support of the test software and instrumentation system
- Typically two level II's are used for an ILRT and a third is available on stand-by if needed for any reason.

Contingency Plans

Having designed and build the system we can fully support all aspect of it.

A large reserve supply of instruments is maintained in our central lab.

Any emergency or last minute calibrations may be done quickly by our staff within our facilities.

Contingency Plans

For a typical ILRT Graftel supplies the ILRT Instruments listed below.

- 30 Model 9202 Temperature Sensors, (24 required and six spares)
- 10 Model 9203 RH Sensors, (six required and four spares)
- 2 Paroscientific pressure transmitters, (one required and one spare)
- 9 Repeater/Converter/Power Supply Boxes, (six required and four spares)
- 2 Rotameters for induced flow, (one required and one spare)
- 1 Thermo hygrometer, used to perform pretest checks on the temperature and RH sensors
- 2 PCs, used to collect data and perform all calculations, (one required and one spare)
- PC and instrumentation cables outside of containment, (one or two spares of each)
- Instrumentation cables inside of containment, (30% spares)