In-Plant Training

Compressed Air Assessment Basics

March 3 2015
What is an In-Plant Training?

• In-Plant Trainings (INPLTs) are system-specific workshops led by Better Plants experts that train participants on how to identify, implement, and replicate energy-saving projects.

• Better Plant partners host an on-site, three-day training at one of their facilities, and invite others to attend.

• The training traditionally focus around a topic such as:
  – Compressed air
  – Fans
  – Motor-driven systems.
  – Steam
  – Process heating
  – Pumps
  – Energy Management/ISO 50001
What is an In-Plant Training?

• Technical expertise gained through the INPLTIs help companies overcome common, critical barriers to adopting energy management practices and technologies, such as lack of technical expertise and insufficient senior management buy in for implementing energy-saving projects.

• Personnel from other facilities within the company, as well as from other companies in the area and suppliers, may be invited to attend.

• Since April 2011, DOE has conducted 40 INPLTIs that have attracted about 765 participants and led to the identification of close to 2.7 TBtu in annual energy savings and more than $14 million in associated cost savings.
The Facilitator

- Frank Moskowitz – Draw Professional Services
  - Qualified AIRMaster+ Specialist
    - AIRMaster+ and LogTool Compressed Air Assessment Tools
  - Compressed Air Challenge Instructor for Fundamentals & Advanced Workshop
  - Instructor for AIRMaster+ Qualified Specialist Workshop
  - DOE Compressed Air System Energy Expert
    - In-Plant Training & Save Energy Now Assessments
  - Co-Vice Chair ASME EA-4 Energy Assessment for Compressed Air Systems
  - International Standards Organization Technical Advisory Group Member
    - Air compressors and compressed air systems energy management
  - Contact Information:
    - fmoskowitz@drawproservices.com
    - 602-809-4195
Today’s Agenda

• Overview – Compressed Air System Energy Savings
• Planning for the Assessment
• Baseline Measurement
• Compressed Air Energy Opportunities
• Software Tool – LogTool
• Software Tool – AIRMaster+
• Agenda
Overview

Compressed Air System Energy Savings
Compressed Air Systems Total Cost of Ownership

• Equipment cost and maintenance cost represent only a small part of the total cost of operating a compressed air system.

• Electrical cost usually exceeds 75% of the total operating expense.

Source: Compressed Air Challenge®
Compressed Air is Inefficient

- Compressed Air’s Inefficiency:
  - 85% of the power of the prime mover is converted into an unusable form of energy (HEAT)
  - And to a lesser extent, into friction, misuse and noise
Typical Components of Demand

- Production: 50%
- Leaks: 25-30%
- Artificial Demand: 10-15%
- Inappropriate Uses: 5-10%
Compressed Air Versus Other Energy Sources

- 1 hp air motor = 7-8 hp of electrical power
  - 30 scfm @ 90 psig is required by the air motor
  - 6 - 7 bhp at compressor shaft required for 30 scfm
  - 7 - 8 hp electrical power required for this
- Annual energy cost for a 1 hp air motor versus a 1 hp electric motor, 5-day per week, 2 shift operation, $0.05/kWh
- $1,164 vs. $194
INPLT – Planning for the Training Assessment
Compressed Air System Energy Savings
1. System Approach
2. Block Diagrams
3. Key Issues
4. Energy Costs/ Assessment Costs
There are two basic ways to reduce the energy consumption of a compressed air system: produce compressed air more efficiently; and consume less compressed air.
Look from the System Level Approach

- Improve Compressor Control
- Reduce System Pressure
- Reduce Air Demand
• Compressor manufacturers spend a great deal of money to obtain optimum efficiency of their individual products…….
  – only to see much of the energy savings squandered in a poorly designed and managed system.

• The following information can increase your productivity while Saving Energy
Reduce the number of compressors at reduced capacity

- Base load as many compressors as possible.

![Diagram showing pressure (psig) and production minimum requirement for compressors #1 to #4.]
Reduce the number of compressors at reduced capacity

- Use Automation with single setpoint control scheme

![Diagram showing pressure levels: 80 psig (Production minimum requirement), 90 psig, 95 psig, 100 psig (Load pressure), 105 psig, 110 psig (Unload pressure).]
Baseline Energy Opportunities Control Strategies

Source: Compressed Air Challenge®
Reduce pressure at points of use

- The total system may be running at a higher pressure to satisfy the needs of only one point of use.
  - If the high pressure application can be modified to operate at lower pressure, make the fix.
  - If the high pressure application is valid, find a better way to serve it.
  - The single higher pressure point of use can be met with an amplifier or booster.
  - The remainder of the system can operate at a lower pressure, reducing leakage and usage rates and at reduced energy consumption.
Reduce pressure at points of use
Review Air Usage Patterns Regularly

- Understand Your Pressure Profile

![Diagram with labeled components: 300 HP Centrifugal, 200 HP Dry Screw, Filter, Dryer, Receiver, Other uses, Critical user. P indicates point for pressure measurements.]
Review Air Usage Patterns Regularly

Supply

- 110 psig
  - Operating Range of Compressors

- 100 psig
  - Dryer and Filter Pressure Drop

- 90 psig

Demand

- 85 psig
  - Distribution System Pressure Drop

- 70 psig
  - FRL, Valve, Hose, and Disconnect Pressure Drop
Pressure Profile

- Understand Your Pressure Profile
  - Pressure drop increase with the square of the flow increase

![Pressure Loss Through Dryer](chart)

- 1050 cfm / 735 cfm = 30% increase in flow
  \[ (1.42)^2 = 2 \times \text{original pressure drop} \]

- 5 PSIG
- 10 PSIG
A leak consumes 42% more air at 120 psig than at 80 psig adding to the artificial demand on the system.
Leaks & How Demand is Affected by Pressure

**Discharge of air through an orifice (SCFM)**

<table>
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<tr>
<th>Pressure (psi)</th>
<th>1/64”</th>
<th>1/32”</th>
<th>1/16”</th>
<th>1/8”</th>
<th>1/4”</th>
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Leaks are a function of the supply pressure in an uncontrolled system.
- Higher pressure = greater flow
- Lower pressure = less leak flow
Remove Inappropriate Applications

• Many applications can be served more efficiently by: low pressure air from a fan, a blower; or by a vacuum pump, rather than by compressed air.

• Examples of Inappropriate Uses:
  – Cabinet cooling
  – Liquid agitation or stirring
  – Vacuum generation
  – Unregulated Open Blowing
  – Air Motors
  – Atomizing
Where is my air going?

- **Leaks**: 25-30%
- **Artificial Demand**: 10-15%
- **Poor Practices**: 5-10%
- **Production**: 50%
Compressed Air System Block Diagram

- Graphic representation of compressed air system and the relationship of individual components
Darigold Sunnyside
Compressor Room 3
 stil under construction

Compressor #6
QNW-V350-I
#14065519256
350 hp

Compressor #7
QNW-1523
#1406519257
350 hp

3800 gallon Receiver Tank

Zeeks Dryer
3250HSFMW40V
#555240

Filter

4" pipe
Cheese Packaging

Darigold Sunnyside
Cheese Packaging

1/2" pipe

Massman #1 Case Packer

2" pipe

3/4" pipe
1/2" pipe to conveyors

Massman #2 Case Packer

1 1/2" pipe
1/2" pipe to conveyors

Palletizer
Compressed Air System
Issues and Opportunities

• Gather pre-assessment information

**Primary Audit Objectives**

- We need to improve the reliability of the compressed air system in supporting manufacturing operations.

- Production interruptions occur which are a result of poor compressed air system performance; we need to minimize production downtime.

- Product quality is being affected by poor compressed air system performance; we need to reduce our scrap rate.

- Our automated equipment which is operated by compressed air will not achieve its full capacity throughput; we need to know if this is a compressed air related issue.

- We are expanding our production facility and consequently need to expand our existing compressed air system to accommodate the new flows; we want to know if our existing compressors can handle it.

- We need to reduce air demand and lower energy costs of operating our compressed air system.

- We are replacing older air compressors and want to investigate new more efficient type compressors; we want to improve system efficiency and reduce energy costs.

- We have recently eliminated production equipment which used compressed air but the compressors are still using the same energy as before; we need to reduce the compressed air demand.

- Low pressure occurs on a system wide basis and occasionally impacts production.
• Gather pre-assessment information

Potentially Inappropriate Applications

Is compressed air being used for any of the applications on this list?

- Open blowing
- Sparging (agitating, stirring, mixing)
- Aspirating
- Atomizing
- Padding
- Dilute phase transport
- Dense phase transport
- Vacuum generation
- Personnel cooling
- Open hand held blowguns or lances
- Cabinet cooling
- Vacuum venturis
- Diaphragm pumps
- Timer drains/open drains
- Air Motors
INPLT – Baseline Measurement Using:
Software Tools; AIRMaster+ and LogTool
AIRMaster+ a Windows based software tool used to model and analyze industrial compressed air systems:

- Measure / Calculate Annual Baseline Energy & Cost
- Input 24-hour metered airflow or power data
- Assign electrical utility energy schedules
- Simulate compressed air system operation
- Model system operation at various loads
- Estimate Savings of Energy Efficiency Measures
- Is not a substitute for an experienced auditor!
### AIRMaster+ System Profile – Data

#### System Profiles

- **Select**
  - Facility: Mineral Processing
  - System: Main
- **Daytype**: Mon - Fri
- **System pressure control range**: 84.0 - 110.0 psig

#### Data Entry

**Cascade Order - click cell to toggle stage#/"off"**

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</table>

**Profile data type:**

- **Airflow, %capacity**
- **Power, kW**
- Airflow, acfm
- CycleTime
- Volts/Amps

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AIRMaster+
System Profile – Power (kW)
1. Reduce Air Leaks
2. Improve End Use Efficiency
3. Reduce System Air Pressure
4. Use Unloading Controls Adjust Cascading Set Points
5. Use Automatic Sequencer
6. Reduce Run Time
7. Add Primary Receiver Volume
LogTool v2
Version 2.0.80

LogTool is a public domain tool available from SBW Consulting, Inc. and the Compressed Air Challenge (CAC). LogTool was developed in part with funding from CAC. It is designed to assist in the analysis of compressed air system performance measurements. It is a companion tool for AIRMaster+, also available from the CAC.

Continue
LogTool v2

- LogTool is a public domain tool available from SBW Consulting, Inc.
  - Import data from different types of data loggers
  - Display trend plots with one or two Y axes
  - Assist in the analysis of compressed system performance measurements
  - Display DayType plots
  - A companion tool for AIRMaster+, also available from the Compressed Air Challenge
LogTool v2 – Import Data

- The import screen gives you tools to import data from different types of data loggers.
**LogTool v2**

**File**
- Open/Create Database file to store logger data
- [Open an Existing Database (MDB File)](URL)
- Create a New Database (MDB File)

**Folder**
- D:\Audit Related\Kraft

**Import Logger Data**
- Trend
- Scatter
- Day/Type

**Logger Data in LogTool Kraft mdb**

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</tr>
<tr>
<td>Supply Side</td>
<td>Power</td>
<td>Baseline</td>
<td>Weekend not running</td>
<td>#13000 KW</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
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<tr>
<td>Supply Side</td>
<td>Power</td>
<td>Baseline</td>
<td>Weekend running</td>
<td>#10000 KW</td>
<td>129.4</td>
<td>129.7</td>
<td>129.3</td>
<td>130.3</td>
<td>130.6</td>
<td>131.0</td>
<td>130.2</td>
<td>129.9</td>
<td>129.7</td>
</tr>
<tr>
<td>Supply Side</td>
<td>Power</td>
<td>Baseline</td>
<td>Weekend running</td>
<td>#11000 KW</td>
<td>122.9</td>
<td>119.0</td>
<td>120.1</td>
<td>123.1</td>
<td>123.1</td>
<td>123.1</td>
<td>126.0</td>
<td>123.3</td>
<td>130.2</td>
</tr>
<tr>
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<td>Power</td>
<td>Baseline</td>
<td>Weekend running</td>
<td>#12000 KW</td>
<td>84.0</td>
<td>78.2</td>
<td>56.5</td>
<td>65.0</td>
<td>59.3</td>
<td>58.3</td>
<td>69.0</td>
<td>69.1</td>
<td>68.7</td>
</tr>
<tr>
<td>Supply Side</td>
<td>Power</td>
<td>Baseline</td>
<td>Weekend running</td>
<td>#13000 KW</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

### Weekday
- **Flow**: 1885.87, 1861.73, 1938.51, 2063.18, 2042.34, 1917.98, 1871.87, 2004.38, 2123.58, 2054.26, 2036.33, 2008.04
- **Total kW**: 1764.01, 1723.06, 1603.53, 1842.03, 1840.15, 1623.76, 1686.32, 1699.08, 1692.66, 1692.26, 1670.25, 1634.32

### Weekday hourly avg of kW
- **#10000 KW**: 126.8, 126.9, 127.0, 127.6, 127.7, 127.0, 126.9, 127.1, 128.0, 127.1, 127.1, 127.1
- **#11000 KW**: 126.2, 126.2, 126.4, 126.9, 127.0, 126.4, 126.2, 126.4, 127.3, 126.4, 126.4, 126.4
- **Excluded Days**: 106.8, 101.6, 114.5, 118.9, 115.0, 112.0, 103.2, 118.3, 119.2, 119.5, 116.6, 113.9
- **Weekend running**: Total kW: 359.9, 354.7, 367.9, 398.1, 396.0, 366.5, 356.3, 384.3, 413.5, 397.8, 397.2, 386.2
- **Weekday low production hourly avg of kW**: #10000 KW: 120.2, 118.2, 119.5, 118.4, 119.7, 117.1, 116.2, 117.7, 114.7, 112.1, 112.0, 112.0
- **Excluded Days**: #11000 KW: 64.2, 60.3, 64.6, 61.0, 61.1, 58.4, 60.5, 59.3, 62.4, 60.4, 61.5, 63.8
- **Weekend not running**: Total kW: 184.4, 178.5, 184.1, 179.4, 180.8, 175.5, 176.7, 177.0, 172.5, 173.5, 176.5
- **Weekend normal production hourly avg of kW**: #10000 KW: 129.4, 129.7, 129.3, 130.3, 130.6, 131.0, 130.2, 129.9, 129.7, 129.4, 129.8, 130.9
- **Excluded Days**: #11000 KW: 122.9, 119.0, 120.1, 123.1, 123.1, 120.9, 118.6, 120.6, 123.3, 123.0, 123.9, 121.5
- **Weekend low production**: Total kW: 336.3, 327.0, 305.9, 318.4, 310.8, 307.9, 319.8, 322.3, 321.5, 324.7, 317.9, 310.9

### SCFM/KW
- **Weekday**: 5.2, 5.2, 5.3, 5.2, 5.2, 5.3, 5.2, 5.1, 5.2, 5.1, 5.1, 5.1
- **Weekend low production**: 5.1, 5.1, 5.1, 5.1, 5.1, 5.1, 5.1, 5.0, 5.1, 5.1, 5.1, 5.1
Log Tool Plot

- Understand Your Pressure Profile
  - Pressure drop increase with the square of the flow increase

Pressure Loss Through Dryer

1050cfm/735cfm = 30% increase in flow = (1.42)^2 = 2x original pressure drop

5 PSI

10 PSI
Create Day Types for AIRMaster+ System Profile
## View DayType Profiles in Excel

![Excel Spreadsheet]

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>System Type</td>
<td>Period</td>
<td>DayTypeName</td>
<td>ChannelName</td>
<td>Hr_01</td>
<td>Hr_02</td>
<td>Hr_03</td>
<td>Hr_04</td>
<td>Hr_05</td>
<td>Hr_06</td>
<td>Hr_07</td>
<td>Hr_08</td>
<td>Hr_09</td>
<td>Hr_10</td>
<td>Hr_11</td>
</tr>
<tr>
<td>4</td>
<td>Main</td>
<td>Not Assign</td>
<td>Baseline</td>
<td>Mon-Tue Production</td>
<td>COMP1 KW</td>
<td>22.99389</td>
<td>23.62035</td>
<td>22.91625</td>
<td>22.06586</td>
<td>22.3651</td>
<td>23.15486</td>
<td>37.79541</td>
<td>42.6151</td>
<td>46.79652</td>
<td>47.95981</td>
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<tr>
<td>6</td>
<td>Main</td>
<td>Not Assign</td>
<td>Baseline</td>
<td>Wed-Thu-Fri Production</td>
<td>COMP1 KW</td>
<td>26.51718</td>
<td>26.62003</td>
<td>27.10745</td>
<td>26.64304</td>
<td>26.52635</td>
<td>25.37759</td>
<td>39.44526</td>
<td>43.26663</td>
<td>45.11413</td>
<td>44.40184</td>
</tr>
</tbody>
</table>

Note: The table shows data for different system types and days, with columns for Hr_01 to Hr_11, representing energy consumption or usage data for each hour.
AIRMaster+ System Profile – Data

**System Profiles**

- **File**
- **Calculators**
- **Help**

**Select**
- **Facility**: Mineral Processing
- **System**: Main

**Daytype**: Mon - Fri

**System pressure control range**: 84.0 - 110.0 psig

### Data Entry

<table>
<thead>
<tr>
<th>Compressor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>350 hp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150 hp #1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>150 hp #2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Profile data type**: Airflow, %capacity

- **Compressor**
  - 350 hp
  - 150 hp #1
  - 150 hp #2

**Airflow, %capacity**

- **Power, kW**
  - 0
  - 100.0
  - 100.0
  - 100.0
  - 100.0
  - 100.0
  - 100.0
  - 100.0
  - 100.0
  - 100.0

- **Airflow, acfm**
  - 0
  - 50.0
  - 50.0
  - 50.0
  - 90.0
  - 90.0
  - 90.0
  - 90.0

- **CycleTime**
  - 0
  - 40.0
  - 40.0
  - 40.0
  - 80.0
  - 80.0
  - 80.0
  - 80.0

- **Volts/Amps**
  - 0
  - 0.0
  - 0.0
  - 0.0
  - 0.0
  - 0.0
  - 0.0
  - 0.0
Quantifying Opportunities – Tools to Help

• Software Tool – AIRMaster+
  – Baseline Measurement & Annual energy use
  – EEM’s (energy efficiency measures) and savings

• Software Tool – LogTool
  – Charting trend performance
  – Assess dynamics, and Compressor Control Response
  – Daily System Profiles Define Day Types
INPLT on-site March 24th – 26th, 2015

Compressed Air System Energy Savings
INPLT Compressed Air Training System Approach

• Systems engineering focuses on defining stakeholders’ needs and required system functionality. From energy input to air compressors to work performed in the production process.
  – Understand compressed air point of use as it supports critical plant production functions.
  – Correct existing poor performing applications and those that upset system operation.
  – Eliminate wasteful practices, leaks, artificial demand, and inappropriate use.
  – Create and maintain an energy balance between supply and demand.
  – Optimize compressed air energy storage and air compressor control.
• **Schedule for On-site Assessments**
  
  – The following is a general overview of a typical 3-day, on-site assessment. The schedule may vary based on specific circumstances.
  
  – **Day One:** The Qualified Specialist/Energy Expert conducts a safety briefing for your plant team and tours the plant. Your team agrees on potential energy efficiency opportunities to investigate, and begins data collection for potential opportunities.
  
  – **Day Two:** The data collection continues and the DOE software assessment tool is applied to quantify potential opportunities. The lead person at your plant and the Qualified Specialist/Energy Expert discuss and agree on the opportunities identified.
  
  – **Day Three:** Wrap up the software tool analysis and focus on answering questions. The lead person at the plant and the Qualified Specialist/Energy Expert discuss how to gain management support to implement opportunities identified in the assessment. A close-out meeting is held in the afternoon to review results.
  
• After the assessment, your plant will receive a detailed report identifying opportunities. View assessment reports from other plants.
### Darigold INPLT Training

#### On-Site Agenda

**Tuesday March 24th**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter(s)</th>
</tr>
</thead>
</table>
| 8:00-8:30am     | Arrival at Darigold Plant, Introductions and In-Plant Training Overview, Opening Remarks etc. Safety Overview | Frank Moskowitz (Draw Professional Services, Energy Experts in Compressed Air Systems)  
<p>|                 |                                                                          | Paul Lemar (DOE Technical account manager)                                      |
|                 |                                                                          | Tom Rouleau (Technical manager Sunnyside)                                         |
|                 |                                                                          | Uli Schildt (Darigold Energy Engineer)                                          |
| 8:30-11:00am    | Compressed Air Energy Management Training                                 | Frank Moskowitz                                                                 |
| 8:30-11:00am    |                                                           | - Energy Savings Assessment Results—Summary                                    |
|                 |                                                           | - Overview on DOEs Free Compressed Air Software Tool (AirMaster+)              |
|                 |                                                           | - Q&amp;A and Discussion                                                           |
| 11:00-11:15     | Coffee Break                                                            |                                                                             |
| 11:15-12:00     | Plant Tour: Measurement and Savings Project Demonstration                | Frank Moskowitz                                                                 |
| 12:00-12:45     | Lunch Break                                                              |                                                                             |
| 12:45-4:00      | Measurement and Savings Project Demonstration Cont’d                     | Frank Moskowitz                                                                 |
| 4:00-4:30       | Complete Training Evaluation Form and Adjourn                            |                                                                             |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00-8:30</td>
<td>Introductions and Q&amp;A from previous day</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>8:30-11:00</td>
<td>Data Collection, Field Work and Discussion</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>11:00-11:15</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:15-12:00</td>
<td>The data collection continues and the DOE software assessment tool is applied to quantify potential opportunities</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>12:00-12:45</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>12:45-4:00</td>
<td>More Data Collection, Field Work, Discussion</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>4:00-4:30</td>
<td>Wrap-Up and Complete Evaluations</td>
<td>Frank Moskowitz and</td>
</tr>
</tbody>
</table>
Darigold INPLT Training
On-Site Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>8:00-8:30</td>
<td>Introductions and Q&amp;A from previous day</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>8:30-11:00</td>
<td>Wrap up the software tool analysis and focus on answering questions</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>11:00-11:15</td>
<td>Coffee Break</td>
<td></td>
</tr>
<tr>
<td>11:15-12:00</td>
<td>discuss how to gain management support to implement opportunities identified in the assessment</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>12:00-12:45</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>12:45-1:30</td>
<td>Close out meeting to review results</td>
<td>Frank Moskowitz</td>
</tr>
<tr>
<td>1:30 – 2:00</td>
<td>Wrap-Up and Complete Evaluations</td>
<td>Frank Moskowitz and</td>
</tr>
</tbody>
</table>
Thanks for Attending!

• Questions?

• Paul Lemar
  – DOE Technical Account Mgr.
  – pll@rdcnet.com

• Frank Moskowitz
  – Draw Professional Services
  – fmoskowitz@drawproservices.com
  – 602-809-4195 cell