

Metal Accounting is critical for corporate governance in monitoring, checking and improving performance, as well as in identifying and quantifying losses and emissions. XPS follows AMIRA's P754 Code of Practice in its metallurgical accounting review of your process. AMIRA best practices, along with XPS's experience and expertise in applied methodologies allow us to arrive at an unbiased and cost-effective diagnosis of the metallurgical accounting procedures you have in place, and identify the most significant sources of uncertainty to help guide process improvement.

Our team of experts consists of senior metallurgists, process control and engineers (knowledgeable in instrumentation best practices), and technicians with extensive plant experience who examine all aspects of your process, from an overview / audit of the flowsheet and existing instrumentation, to sampling procedures and statistical evaluation of the data, providing sound and practicable solutions in support of accurate metallurgical accounting.

Metallurgical Accounting

A properly designed metallurgical accounting process can provide powerful insight into your operation:

- Identification of production variability and inefficiencies
- Accurate measurement of production, driving end metal unit sales
- Information flow to management for production forecasting and maximizing plant economics
- Troubleshooting metallurgical process issues, minimizing costly losses

The AMIRA P754 project developed a Code of Practice and Guidelines to address the historically poor performance of metal accounting relative to acceptable corporate governance practices. Contributing factors included poor understanding of the principles of mass balancing and metal accounting, as well as inadequate design, installation, operation, and maintenance of equipment providing the measurements that the process relies upon.

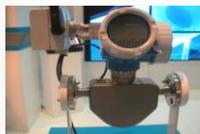
The Code has been well accepted by industry, and AMIRA continues to manage and promote the Code globally on behalf of the industry.

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When looking to audit or improve your metallurgical accounting process, our team looks at a number of key areas, including:

- **A systematic plant audit**
- **Overall flowsheet design and material balance**
- **Existing met accounting systems**
- **Appropriate instrumentation and measurement of streams**
- **Effective sample gathering, handling and measurement**
- **Procedures and training**



Coriolis Mass Flow Meters



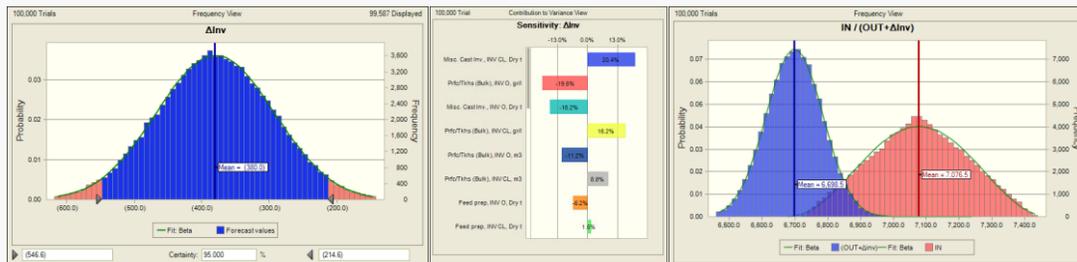
XPS CAPABILITIES

DECISIVE...DYNAMIC...DIFFERENT...

Modeling and Material Balance

In its Metal Accounting review, XPS follows the AMIRA P754 standard supported by our 'in-house' developed methodology using Crystal Ball Monte Carlo analysis. The methodology assists in *rapidly arriving at unbiased and cost-effective diagnosis of the accounting procedure and identification of the most significant sources of uncertainty.*

We are capable of identifying and ranking the factors which need to be improved in order to improve metal accountability and recovery and then rank those factors / improvements in the order of their contribution to the overall improvement. The analysis is a decision-making tool to determine which measurements need to be improved and help illustrate if 'unaccountable loss' is a result of the level of (in)accuracy of the measuring methods or a possible physical loss.



Instrumentation and Measurement

Process instrumentation is a critical aspect of metallurgical accounting that is often overlooked. Business decisions are made based on process measurements with the inherent assumption that the measurements are accurate and reliable.

Our process control team works with your plant operations and metallurgical accounting teams to assess, determine and recommend appropriate instrumentation requirements that help ensure reliable process data and accurate metal balancing.

XPS's Process Control group works onsite at various operations around the world, with a proven approach focusing on industry 'best practices' that delivers practical and robust solutions.

Short Courses on Sampling

As a part of a metallurgical accounting review XPS examines in detail key aspects of sampling such as:

- Unbiased, true representative sampling
- Minimum sample mass
- Safety Line
- Quality of extraction
- Sample handling
- Sample timing and independence

However carefully produced, assays and test results are meaningless unless they used true, representative samples. Theory and best practice of sampling is rarely taught in the mineral processing and chemical engineering schools. XPS has developed a series of short courses that may be presented around the world – at a university, at a conference, at XPS, or at an operations site – to fill the gap in this knowledge.

The XPS sampling course covers typical applications such as routine concentrator sampling of float feed, final concentrate and final tailings for metal accounting, as well as sampling of SAG Mill Feed, Crushed Ball Mill Feed, or Drill Core for flotation testing.

