The application of the AMIRA P754 metal accounting code in the coal industry

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Synopsis

The development of an accounting code for the metallurgical industry has been debated for many years. Following the series of tumultuous economic events in the nineties and earlier this century that have affected business, there was much need for legislation to be passed to minimize potential risk. One of the consequences to affect the mining industry was the enhancement of existing geological codes for reporting. In parallel the sponsors of AMIRA have taken the brave step to develop a generic code for metal accounting that embraces the full gamut of industry. In this paper the code will be reviewed in the context of metallurgical accounting as it applies to coal preparation.

This paper provides the background for this development and an insight into the mechanism for the debate for the generation of this code. The key elements of the code as it applies to the coal industry are explained but most importantly the key opportunities are highlighted.

Introduction

In the latter part of the last century and continuing into this century, the investment world was littered with financial scandal. The key issues that arose were the application of existing standards and practices and its manipulation by a number of parties in the generation of information. The resultant fallout led to the tightening up of accounting standards and in some cases quite stringent requirements were placed on company directors on declarations on the veracity of such accounts. This problem remains to be addresse satisfactorily.

Financial accounting in the resources industry has in general fallen within the accepted norms of current best practice of what has been required by the relevant applicable financial standards. Many incidents in the recent past have called on certain public companies to restate their reserves, which had implications on a company's balance sheet and led to a review of the standards of practice for geological reporting and a subsequent tightening up of such reporting to prevent such occurrences in the future.

In the mining industry, the accounting for production forms the backbone of a company's accounts and key to this is the final element of the supply chain—the metallurgical process and its generation of a final product for onward use by another party. Despite all the requirements for the reporting of geological reserves/resources and the various applicable financial standards for financial reporting, there has been no equivalent standard or requirement for metallurgical accounting. The development of the AMIRA P754 code attempts to bridge this gap; however, it is limited to the reconciliation issues within the metallurgical process and at this stage does not fully attempt to reconcile back to the reserve base.

This paper is the second of an intended set of three papers discussing the reconciliation issues from coal face to end user. The first paper (Power 2006) details the principles that the author considers to be the appropriate for best practice for metallurgical accounting in coal preparation plants. The final paper will address the coal equivalent of reconciliation of 'mine to mill and beyond' in terms of reconciliation.

In the examination of the implications of the code in the mining industry, it must be remembered that the code is not mandatory, but merely implies the application of best practice to metallurgical accounting. That is not to say that the existence of the code may indeed become de facto over time as corporate governance requirements evolve.

Accounting and its application

Accounting can be defined as a series of processes/techniques that are employed to measure and identify economic information, which users find helpful in making decisions.

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One of the key components of this definition is the interpretation of the term user in the context of the making of decisions based upon the generation of such economic information. The development of the various standards and practices identified above have sought to protect one user—the external user who uses such information to make investment decisions on the basis that such information has been generated in a manner consistent with the norms required of existing standards. Whereas this is the true intention, cognizance needs to taken that the application of appropriate structure to any form of reporting provides an opportunity to identify gaps in the performance/asset base that can result in significant savings/profit optimization.

The AMIRA P754 code for metallurgical accounting is probably onerous and somewhat daunting at first sight but, like any new system, will take a lot of work to develop at any particular site. Once in place, however, and once a reasonable approach to its adoption takes place, all of the advantages arising from the identification of measurement gaps in any particular process can realize real value for that operation.

Development of the AMIRA P754 code for metallurgical accounting

AMIRA International is an independent association of minerals companies created to develop, broker, and facilitate collaborative research projects (AMIRA International website). The main thrust of this organization has been to develop collaborative liaisons between sponsoring companies to pool scarce resources to sponsor the best available research teams across the globe to conduct metallurgical research.

Following a symposium titled 'Challenges in Metallurgical Accounting & Information Management' held in Cape Town during 2001, a project under the auspices of AMIRA International called 'P754—Metal Accounting and Reconciliation' was proposed. Further in-depth background is to be found in P754 Metal Accounting—Code of Practice and Guidelines: Release 3 February 2007. This document forms a significant reference base for this paper and for completeness on the subject as it applies to coal preparation; it should be read in conjunction with this paper.

The P754 code as it applies to coal

The code has ten guiding principles, which are described as follows:

- The coal accounting system must be based on accurate measurement based on mass and some form of component balance. A check in-check out system type approach must be employed on the final product(s) in conformity with the best practice systems as defined in the code
- Consistency and transparency and the source of all input data must be clear and understood by all the users of the metallurgical reconciliation system. Areas of risk within the system must be understood and auditable
- Each operation must have a well-documented procedure for performing the metallurgical balance. The procedure must be user friendly and must not be dependent on one person to drive the system
- The system must be subject to regular internal and external audits, which identify risks and recommendations to mitigate these risks if the acceptable risk level is exceeded
- The accounting system must render results in a timely fashion to fulfil operational requirements
- Authorization protocols need to be in place for the use of provisional or replacement data in the system. This includes the appropriate sign off for rogue or faulty data, etc.
- The system must generate sufficient data to enable reconciliation of system balances within the overall system balance. This implies that issues of mass/component balances have a means of being cross-checked to verify the integrity of the data and the robustness of the overall balance
- Target levels of accuracy for mass measurement devices and sampling systems must be identified at all principle input and output used for accounting purposes
- All major stockpiles should be subject to survey measurements at frequencies prescribed in the operation's standard procedure for metallurgical accounting. Issues surrounding assumptions used for compaction, bulk density, discounting, losses/gains in mass, moisture, etc. must also be detailed in the procedure and subject to a clear audit trail, particularly for designated financial reporting periods
- Areas of bias must be identified and minimized as quickly as possible.

Implications for the coal industry

The above principles spell out a pretty generic approach for all metallurgical industry but what does it really mean for the industry? Quite simply, the days where the pure amount of coal sold versus what the miners say was delivered without any interrogation of the dynamics of the system will no longer be sufficient. There is no doubt that the current practices at a number of operations are clearly as inelegant as that but one has got to ask, even after going through the principles outlined above, how inelegant is one's accounting system when compared to these principles? In the future, under the auspices of better governance, the first question that will be asked is, 'where is the procedure for coal accounting?'

For practical purposes, a procedure for each operation has to be drawn up. This procedure will detail all inputs and outputs of the system and individual sub-systems (run of mine stockpiles, product stockpiles, intermediate storage silos/bunkers/bins, etc.) so that a series of balances can be carried out to support the integrity of the overall metallurgical balance. Within the procedure, the basis for the balance will have to be stated (moisture basis, mass, designated components—if any) in such a manner that the inherent logic and application of the procedure can readily be applied by colliery personnel and audited by internal or external persons. In simple terms, once a solid procedure for metallurgical accounting has been developed for an operation in conformance with the AMIRA P754 code, then a major step has been undertaken to comply with best practice—the next

step is the adoption of the procedure by all parties and followed by final implementation of the procedure. This adoption step is critical and should not be underestimated; if the key players in the operation do not accept requirements of the procedure, then the system will most certainly fail.

A further culture shock for an operation is the prospect of being audited. Anyone with a robust procedure and using it in a reasonable fashion will not be too concerned by the prospect of a metallurgical audit carried out by internal/external parties. In the coal industry in South Africa, it is extraordinary that a question of metallurgical efficiency or issues around coal losses are at times 'wished away' or 'conveniently not measured' instead of being embraced as optimization opportunities.

Repeated problems have been experienced at collieries due to the lack of a proper coal accounting procedure with resultant selective/faulty interpretation of data, which invariably results in an overdeclaration of final product. Hindsight always proves to be a wonderful tool but the learning experience somehow seems to get unlearnt and the risk of recurrence remains. Put simply, if one has a reasonable procedure which is reviewed regularly and subject to proper audit processes, the chances that the metallurgical balance could be compromised is significantly reduced.

Gap identification and potential opportunities from a metallurgical accounting system

Given that at some stage the industry is compelled to adopt a formal code of accounting as described in AMIRA P754, should this be seen as yet another chore for compliance to corporate governance requirements? The simple answer to this is no.

Why would such governance systems be put in place? In the majority of instances, such systems are a mere reflection on how best to manage a system. The systems may seem onerous at first sight but if one takes the code step by step and sifts out what is applicable/not applicable within each chapter of the code, then the basis of a procedure can be considered prior to drafting.

Once a procedure is drafted, adopted, and implemented, a series of process platforms can result, depending on the systems of reconciliation that are used in the procedure to interrogate the data. In the first reference (Power, 2006) many approaches are given for the basis of metallurgical accounting for coal using back calculations based on residue data to determine coal losses. These principles can be used for any system or sub-system in a coal plant. For example, in two of the current joint venture plants being developed by Anglo Coal in South Africa—Mafube Colliery with Exxaro and Phola Coal Plant with BHP Billiton Energy Coal South Africa; the middlings stream will be subjected to regular washability tests to minimize misplacement of the more valuable primary export fraction. Protocols will be developed in the accounting procedure to formally account for this function. When proper procedures are in place at these operations, this key metric will be imprinted into the culture of both plants.

Criticisms of the code

Whereas author contributed comments on behalf of the coal industry during the early drafting of the code, the references to coal and methods of performing a metallurgical balance are scant at best. The code tries to be all things to all men and really the principle of doing this certainly leaves it wanting in respect to performing a metallurgical balance in a coal plant. That is not to say that the code cannot be embraced by the coal industry as a whole. If procedures are developed in accordance with the code's guiding principles, then the coal industry will be better off as a result.

A further criticism of the code relates to the use of the term 'competent person'. A concern is that this can escalate to the creation of a new industry of consultants with specific specialties that may be forced upon the industry—for example, sampling experts, sample preparation experts, data logging experts, etc. The inappropriate use of experts may be more value destroying rather than value adding.

A final criticism of the code is the lack of real consultation of the industry as a whole; unfortunately, from a practical point of view, the issue of metallurgical accounting can be emotive and alternative approaches to achieving a balance could have been considered in many cases. In the case of this draft, as was in the earlier drafts, this issue still remains; and no doubt as the code evolves in the future common sense approaches will prevail. The many authors and contributors have done a commendable job but it is not easy to satisfy the concerns of the full constituency that it serves—not an enviable task.

Conclusions

In presenting this review of the AMIRA P754 code, the simple conclusions are as follows:

- Review the metallurgical balancing process at the coal plant; if there is no set procedure then reconsider this based on the argument put forward here and in the first referenced paper (Power, 2006)
- Read the latest version of the code and incorporate the principles in the metallurgical balancing procedure
- Once implemented, examine the yield optimization opportunities that become evident.

A universal metallurgical balancing code of practice for the mining industry is inevitable. Whereas the AMIRA P754 code is not mandatory or prescribed in any shape or form, it does provide an excellent platform for best practice.

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