Mines of information

How Australia shows the way in worldwide resources reporting

Substantial advances have been made in the development of uniform national and international standards covering the classification and public reporting of mineral resources and reserves. NORMAN MISKELLY describes how the Australasian Code for Reporting of Mineral Resources and Ore Reserves became a model for worldwide harmonisation of guidelines.

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The quality of mineral resource and reserve reporting has come a long way in the past 30 years. The evolving reporting process has now reached the point where most major mining countries are working to common definitions of resources and reserves and to common or compatible public reporting standards, based largely on the 1999 “Australasian Code for Reporting of Mineral Resources and Ore Reserves” (JORC Code).

The advanced state of the code and the long and successful history of the Australasian Joint Ore Reserves Committee (JORC) has enabled many other countries to leap-frog the learning process involved in introducing such codes. The result is that the international mining and financing communities now have a greater degree of confidence in the public reporting of resources and reserves than in the past. More work will be required before truly international standards can be developed, and processes are in hand on several fronts to bring this to fruition.

The history of attempts by various countries to establish national standards for classifying and publicly reporting ore reserves, and in more recent times, mineral resources, goes back at least 100 years. In 1909, Herbert Hoover, then working in Australia and later to become president of the United States of America, published his classic Principles of Mining, in which he recommended a three-fold division of ore reserves into proved, probable and prospective. Unfortunately Hoover’s simple and sensible classification system was not universally adopted, and the period through to quite recent times was marked by a mish-mash of classification and reporting systems developed to suit individual mines and companies.

However, recent decades have seen an upsurge in interest in this subject, with four major events acting as particular stimuli: the so-called Poseidon boom-and-bust in Australia in the late 1960s; the release of a document entitled “Principles of a Resource/Reserve Classification for Minerals” (commonly known as Circular 831) by the US Bureau of Mines and the US Geological Survey in 1980; the first release of the Australasian JORC Code in 1989; and the Indonesian/Canadian Busang scandal of 1997.

Concern with unacceptable reporting practices associated with the so-called Poseidon nickel boom resulted in warnings from government and regulatory bodies that unless the mining industry developed appropriate reporting standards, the regulators would do so themselves.
In 1980, the second key event occurred with the release in the US of Circular 831. This landmark document established for the first time a clear division between resources, representing in-situ material, and reserves, representing economically extractable material. This concept was to be adapted by JORC towards the end of that decade to apply to reporting at a deposit and company scale.

In February 1989, JORC released the first version of the JORC Code, which was immediately incorporated into Australian Stock Exchange (ASX) listing rules, thereby becoming binding on companies listed on the ASX. It was also immediately adopted by the AusIMM as an Institute code, binding on members of the AusIMM. Through these processes, it became mandatory for individuals and companies to conform with the code, and this has been the dominant factor underpinning its success. It was adopted as an AIG Code in 1992 and in the same year was incorporated into New Zealand Stock Exchange (NZSE) listing rules.

In 1997, the fourth key event occurred, with the eruption of the Busang scandal, the “gold deposit” being located in Indonesia and the main corporate players domiciled in Canada. In response to Busang and a number of similar events, Canadian regulators set up the Mining Standards Task Force (MSTF), which produced a report in 1999 recommending standards for all aspects of mineral exploration, ranging from the conduct of field exploration programs to the reporting of resource/reserve estimates. A key concept introduced by the MSTF was the Qualified Person, an extension of the JORC Competent Person into a broader range of activities and responsibilities. Most of the MSTF recommendations have been enshrined in regulations governing the activities of mining companies listed on Canadian stock exchanges, effective from February 2001.

Stimulated partly by the outcry over Busang and similar events elsewhere, and partly by a successful push by the Council of Mining and Metallurgical Institutions (CMMI) to establish internationally accepted resource/reserve definitions, the US, Canada, South Africa and the UK revised their reporting standards in the late 1990s, basing them substantially on the JORC Code. The UK is currently working with the European Federation of Geologists and the Institute of Geologists of Ireland to produce a European Code.

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HISTORY OF INTERNATIONAL REPORTING STANDARDS

Early tentative attempts to establish international standards for classifying and reporting ore reserves (Blondel and Lasky 1956) had little success until 1993 when the CMMI set up a Mineral Resources/Reserves International Definitions Working Group. After several years of “shuttle diplomacy” and negotiations, led primarily by the CMMI Working Group Convenor (and then chairman of JORC) Norman Miskelly, provisional agreement was reached at a meeting in Denver, Colorado, in October 1997 by the five participating nations (Australia, South Africa, the UK, Canada and the US) on definitions for the two major categories, mineral resources and mineral reserves, and for their respective sub-categories, measured, indicated and inferred mineral resources, and proved and probable mineral reserves (Miskelly 1997). These definitions were incorporated into the 1999 JORC Code, and were subsequently incorporated, largely unchanged — except in the case of Canada for reasons of consistency with regulatory documents — into similar standards for the other participating countries.

Also, since 1992 the United Nations Economic Commission for Europe (UN–ECE) had been developing a UN Framework Classification (UNFC) to enable comparison of different national mineral resource and reserve classifications, particularly for those countries in transition to market economies.

Meetings in Geneva in 1998 and 1999 between the CMMI Mineral Resources/Reserves International Reporting Group and the UN–ECE produced an agreement to incorporate CMMI standard reporting definitions into the UNFC for categories common to both systems. This means that the UN–ECE system, which is being implemented in more than 60 countries, mainly in ex-Iron Curtain and other non-Western countries, will promote the industry-friendly CMMI definitions for market-oriented public reporting, substantially increasing the international influence of the CMMI definitions.

The success of the CMMI initiative has been such that consideration is now being given to developing a World Code. This would include the formulation of an international definition for a Competent Person (in Canada, a Qualified Person), reciprocal recognition of Competent Persons between participating nations, a list of principles which would constitute minimum requirements for professional rules of conduct for Competent/Qualified Persons, and an international reporting code and guidelines. It is hoped that major progress on this proposal will be made during 2001.

THE JORC CODE IN AUSTRALASIA

The purpose of the JORC Code is to provide a minimum standard for reporting of exploration results, mineral resources and ore reserves in Australasia. The principles of the code can be summarised (Clause 4 of the 1999 Code) as transparency, materiality and competence.
The mining industry has long recognised the need for international standards as a way to improve communications in the mining industry and with stakeholders outside the industry.

Responsibility for estimation of mineral resources and reserves must be clearly assigned to a Competent Person. The CMMI Group intends to develop an international definition of the Competent Person, including reciprocity conditions for recognition of the Competent Person across national boundaries.

CURRENT STATUS
A comparison of national codes and guidelines illustrates the progress already made and steps to be taken before international standards are developed and uniformly recognised.

Australia
The JORC Code forms the basis of all other national codes which have been developed over the past 10 years. All Australian and New Zealand companies, as well as all international companies listed in Australia or New Zealand, have accepted the code. It is also recognised as a world standard by most international financial institutions and large consulting companies. In addition to including the JORC Code as part of its listing rules, the Australian Stock Exchange has included the “recognised mining professional” rule. This permits ASX-listed companies reporting on mineral deposits outside of Australia to report to the ASX, when the Competent Person requirements of the JORC Code cannot be met. However, such reporting must comply with JORC Code standards.

Over the years, the JORC Code has been improved by taking into account codes and guidelines developed by other countries, which were themselves based on earlier versions of the JORC Code. This “leap-frog” improvement process has been effective and should be maintained even after international standards are accepted.

South Africa
As of March 2000, the entire mineral industry of South Africa, as well as the South African regulatory agencies, adopted the South African Code for Reporting of Mineral Resources and Mineral Reserves (the SAMREC Code). The SAMREC Code follows the JORC Code as to about 97% and must be followed by all companies reporting information in South Africa or listed on the Johannesburg Stock Exchange (JSE). This code includes the CMMI international definitions of mineral resource and mineral reserve and their subcategories. As with all other national codes, country-specific requirements are included, such as conditions for qualification as a Competent Person in South Africa. A system of panel review is operating during the acclimatisation period, similar to the mechanism used in Australia in the initial years following the introduction of its 1989 Code.

United States
The Society for Mining, Metallurgy and Exploration (SME) Guide for Reporting Exploration Information, Mineral Resources and Mineral Reserves is accepted, but is not mandatory, in the US mining industry. The SME Guide closely follows the JORC Code and other international codes, but it is not fully compatible with the requirements of US regulatory agencies such as the Securities and Exchange Commission. Currently, the SEC does not allow the use of the term “Resources" when publishing material not in reserves. However, descriptions such as “Other Mineralisation” may be used.

The SME Guide requires that mineral resources and mineral reserves reports must be prepared by, or under the direction of, a Competent Person. It is likely that international standards will require that Competent Persons are members of a self-regulating professional association with disciplinary powers. This is already the case in Australia and South Africa and will be so in the UK. SME does not have disciplinary power over its members and there is no organisational structure currently in place to fill this gap.

Canada
The Canadian Institute of Mining, Metallurgy and Petroleum (CIM) has generally accepted the definitions of the

NEED FOR INTERNATIONAL STANDARDS
The mining industry has long recognised the need for international standards as a way to improve communications in the mining industry and with stakeholders outside the industry. A significant start has been the broad agreement on JORC, CMMI and UN-ECE definitions for:

- Mineral Resource
- Measured Mineral Resource
- Indicated Mineral Resource
- Inferred Mineral Resource
- Mineral Reserve
- Proved Mineral Reserve
- Probable Mineral Reserve

THE PROPOSED WORLD CODE
With these terms and their definitions being accepted virtually worldwide, the CMMI Group is now taking responsibility for development of international standards — a World Code. These standards must illustrate the conditions to be satisfied for classification of exploration information, mineral resources and reserves according to the accepted international definitions.
CMMI Group. Recommendations of the Mining Standards Task Force of the Toronto Stock Exchange and the Ontario Securities Commission included some terms and conditions that are different from those used in other countries. The Canadian industry will use the term Qualified Person instead of Competent Person. The new Canadian Securities Administrators (CSA) rules came into effect during February 2001.

The task force recommended that CIM and the Canadian mining industry actively contribute to the development of international standards that would be considered for acceptance by CSA. The CIM Reserve Committee published in August 2000 a revised code based on the international CMMI definitions and corresponding closely to the JORC Code. As a reporting standard, along with others including JORC, this will be recognised by CSA. Because of the need to comply with CSA requirements, the CIM standards vary to some extent from those of Australia, South Africa, the UK and the US as a group, but they are nevertheless closely compatible.

**United Kingdom/Europe**

In October 2000, a group comprising the UK Institution of Mining and Metallurgy (IMM), the Geological Society of London, the European Federation of Geologists and the Institute of Geologists of Ireland published its European Reporting Code Consultative Draft, which is based about 95% on the JORC Code with some improvements based on the later SAMREC Code. It also includes some IMM changes concerning specific references to commodities other than metalliferous minerals and adds rules of conduct. The objective is to have the European Code finalised during 2001.

**United Nations Economic Commission for Europe (UN-ECE)**

The UN-ECE participating nations have adopted the CMMI definitions, with minor and inconsequential modifications. It is recognised that the financial resources required to develop mineral deposits are likely to come from countries represented by the CMMI Group, and that these countries are moving towards a single standard, whose recognition would benefit all member countries of the United Nations. The UN-ECE Framework Classification takes into account requirements of the private and state-controlled mining industries, as well as government needs for mineral inventory classifications. For these reasons the CMMI definitions satisfy only part of the UNFC requirements. To satisfy the needs of countries with a variety of centralised and decentralised economic backgrounds, the UN-ECE included definitions for Reconnaissance Mineral Resource, Prefeasibility Mineral Resource, and Feasibility Mineral Resource, which are not used by the CMMI Group.

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**The Next Steps**

A single set of guidelines is now being drafted to form the basis of common guidelines to be considered for adoption by all countries — a World Code. The CMMI Group has decided to prepare the following draft documents, and to submit them to its member countries for review:

- International Definition of the Competent Person.
- International Rules of Conduct for the Competent Person.
- Reciprocity Conditions, or conditions which must be satisfied for a Competent Person to be recognised across national boundaries.

It is expected that, as the guidelines come into use, experience will dictate the need for modifications. The CMMI Group will coordinate requests for changes or improvements, and decide which changes should become part of the guidelines. It is also recognised that country-specific requirements, such as those imposed by national regulatory agencies, are likely to remain and should be additional to the international guidelines.

**Definition of a Competent Person**

Definitions and guidelines can lose their effectiveness unless responsibility for following them is assigned to a specific individual or group of individuals. There is a clear need to define a Competent Person, the expertise required and the responsibilities of this person. The Competent Person will need to belong to a self-regulating organisation which may be a professional organisation or government agency, whose members are bound by a code of ethics or equivalent rules and which has disciplinary powers over its members or those who have a licence to operate.

The increased legal responsibilities of the Competent Person will have consequences which will need careful assessment. These responsibilities are likely to vary significantly between countries. In some jurisdictions, a Competent Person could be sued personally if there are indications that fraudulent public statements were made. The risk of legal action should significantly
increase the likelihood of fraudulent or misleading statements. The challenge of how Competent Persons who are employees of a government agency or who have a licence granted by a government authority will need to be addressed.

An umbrella organisation, which may be an extension of the CMMI Group, will be needed to specify the conditions that national organisations must satisfy if their members are to be recognised as Competent Persons outside their national boundaries.

Reciprocity between countries will require international recognition of the national requirements for qualification as a Competent Person. An umbrella organisation, which may be an extension of the CMMI Group, will be needed to specify the conditions that national organisations must satisfy if their members are to be recognised as Competent Persons outside their national boundaries. The same umbrella organisation will review national organisations, be they government or otherwise, requesting international recognition, and should have the power to discipline member organisations which no longer satisfy the conditions for reciprocity.

CONCLUSION

Much progress has been made in advancing a genuine World Code and its procedures to ensure compliance. But much more remains to be done, before an internationally recognised and accepted World Code becomes a reality. Reaching agreement for the implementation of international standards is a necessity that the world mining industry has recognised. These standards will improve the quality of communication both within and outside the industry. The standards will also impose a higher level of self-discipline and self-regulation on the industry, which should not be considered as an additional hindrance, but rather as a means toward improved communications and better international relations.

The JORC Code has played a critical and path-finding role in initiating the development of international standards. The CMMI Group succeeded in developing internationally recognised definitions of reserves and resources. The full development of international standards is moving forward at an accelerated pace. The success of these standards will require a concerted education effort. The benefits of their adoption must be demonstrated not only to the mining industry, but to all other stakeholders, those investing in the industry, the regulatory agencies and organisations which directly or indirectly influence the viability of the industry.

It is worth noting that the International Accounting Standards Committee, based in London, has acknowledged the importance of JORC and other codes in its recently released Issues Paper on the Extractive Industries. Among its tentative conclusions is one that states: “While the primary financial report should be based on historical costs and not on reserve values, information about reserve quantities and values and changes in them should be disclosed as supplemental information.” The JORC Code has been included as an appendix to the issues paper. This is proof that the successful operation of JORC and CMMI in establishing, in effect, world-recognised standards for reporting of mineral resources and reserves has had ramifications far beyond its initial objectives.

REFERENCES


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Risk factors for the individual company

An assessment is then made of each company’s risk profile in relation to each of the eight standard risk factors for the market concerned. Each risk factor is allocated a score. We score on a scale of 0 to 5, where a zero represents the lowest possible risk in the market and a 5 the highest. The scores are determined relative to other life insurers in the market concerned, and in particular against listed companies for which observed market beta is available.

An overall risk score for each company is determined by adding the eight scores determined above, weighting each score by the corresponding market weight attributed to it in the first step.

Benchmarking

The weighted risk scores for the major companies in the market are examined. In light of this a benchmark table is produced for each market that converts each weighted score into an appropriate beta. Table 2 is an example of one recent calculation.

CONCLUSION

The information required for deriving the risk discount rate using our suggested approach can be summarised as shown in Table 3.

The approach developed in this paper provides a basis for arriving at a suitable risk discount rate, particularly when looking at several markets at the same time. The strengths of the proposed approach are its relative objectivity, its derivation from observable measures, and its reflection of both market and company risk.

There will, however, often be other considerations that influence the ultimate choice of the risk discount rate. In such cases the model provides a framework against which the effect and validity of these considerations can be measured.

REFERENCE