

Refereeing the Good Delivery System

by Stewart Murray, Chief Executive, The London Bullion Market Association

The Good Delivery List lies at the heart of the London bullion market. Not only a vital element in the efficient operation of the London market, it also confers additional credibility on the refiners listed on it. As a result, in recent years precious metals markets and exchanges have increasingly made reference to the LBMA Good Delivery List in their own documentation.

In April 2002 the LBMA announced plans to introduce proactive monitoring of the Good Delivery List, with the intention of introducing this scheme towards the end of that year. The method of monitoring that was chosen involved the testing by the LBMA's referees of a dip sample provided by the refiner being tested.

As refiners on the List are aware, the introduction of the new monitoring scheme has been significantly delayed. There were two main reasons for this. Firstly, at a meeting with a representative group of Good Delivery refiners in June 2002, it was agreed that the proposed method of monitoring required further investigation, especially with respect to the pass/fail assay criteria that were to be used.

More importantly, the introduction of the monitoring scheme required the appointment of additional referees by the LBMA. The need for the additional referees is, in part, because of the number of dip samples that will have to be tested. But in addition, it has been agreed that "four-nines" gold refiners will be monitored using a different approach – namely the assaying by their laboratories of a set of reference samples that will be provided by the referees.

Referee Accreditation

The accreditation of the new referees has proved to be an extremely time-consuming process, but that process has now been concluded and the LBMA will shortly be announcing the names of the new referees.

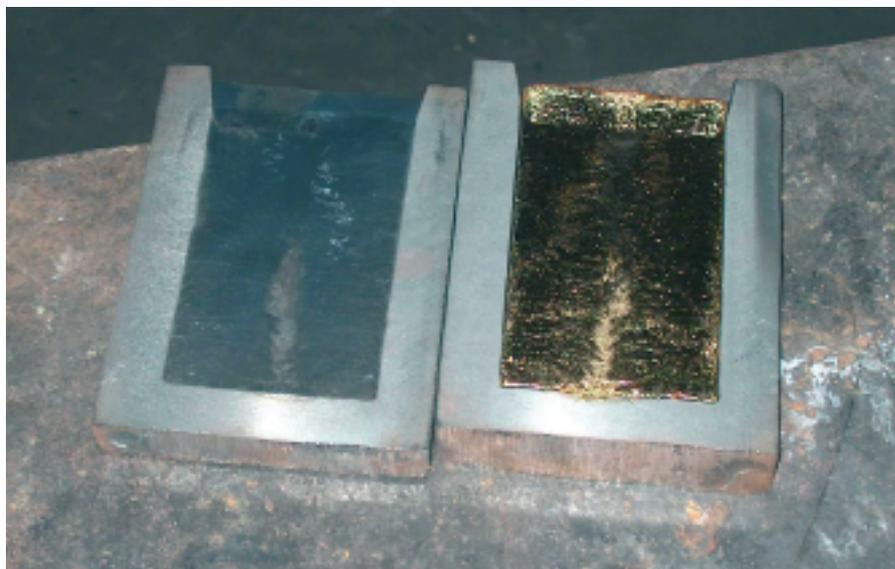
Early in 2002 the LBMA invited a number of Good Delivery List refiners to apply for accreditation as referees. Only companies that were listed for both gold and silver – and that had long histories of refining and that were LBMA Associates – were invited to apply.

From the start, the accreditation process had two main goals: to establish that each referee had the ability:

- To carry out assays and chemical analysis of gold and silver to the highest possible levels of consistency, precision and accuracy
- To manufacture gold and silver reference samples. These samples had to be free from detectable inhomogeneity and had to be assayed to very high levels of accuracy.

The LBMA has insisted that the applicant referees must be able to demonstrate standards of assaying that are significantly above those required for other refiners on the Good Delivery List. Only in this way is it possible for them to manufacture the required reference samples and to test with sufficient reliability the samples provided by the refiners being monitored.

Trialling the dip sample mould – a two-part cast iron mould – which produces a casting 60mm in length, 100 mm in height and 6 mm thick.



The Art and Science of the Assay

During the initial phase of the work with the applicant referees, it became apparent that the level of precision that they were achieving varied between different laboratories and for different methods of assaying. For gold, the LBMA's preferred method of assaying continues to be fire assay, also known as cupellation or gravimetric assaying.

For silver, the direct method of chemical analysis, based on potentiometric titration is used in a number of laboratories and countries, whereas in others, instrumental (i.e., spectrographic) methods are preferred. A notable by-product of the work carried out by the LBMA and the applicant referees over the past two years is that, in the case of silver, spectrographic testing has now replaced potentiometric titration as the preferred method of assaying.

In the first stage of the accreditation process, each referee was required to produce and assay 16 gold samples and 8 silver samples, with each sample bar having a weight of at least one-kilogram. The referees were left to decide on the sample preparation methodology and the method of homogeneity checking. Small test pieces were then cut from each of the samples and then sent to the LBMA, which then redistributed them for cross-checking to the same group of referees and, in some cases, to the LBMA's existing referees.

These cross-checking assays were carried out on a double-blind basis. In other words, none of the applicant referees knew the identity of the samples that they were cross-checking. An analysis of the results of this

work indicated that, particularly for gold, the variation in the precision of assaying and the apparent inhomogeneity of some of the sample bars meant that further improvement in both areas was required.

But progress was being made. In particular, the LBMA had gained an in-depth understanding of what was achievable in terms of sample homogeneity and assaying standards. In the second phase of the work, new sample bars were produced. This time, the LBMA specified not only the methods for sample preparation, but also the standard of precision that had to be achieved during the fire assaying of gold.

The manufacture of a one-kilogram sample that has exactly the same assay throughout its whole volume is in fact a very demanding task. In the first place, the melt from which the starting bar is cast must be totally homogenised before the casting operation. Contamination from the mould material must be avoided, as must contamination during any subsequent mechanical working.

For instance, if the rolling mill used for reduction of a cast sample is not scrupulously clean, it is all too easy for foreign particles to be rolled into the surface – or for other

precious metals to be transferred to the sample surface. For these reasons, homogeneity checking (that is, assaying all parts of the final sample produced) was a vital element in ensuring the quality of the reference samples.

But ultimately the proof of the samples' acceptability for Good Delivery purposes came from the double-blind cross-checking of each sample by two different referees. The assay testing involved a total of (typically) 50 or 60 trials being performed on each complete sample (including the homogeneity checking and cross-checking by other referees).

In order to ensure the integrity of the system, the LBMA alone was provided with full details of these trials. (This assay data has not been disseminated, either to the participating referees or the LBMA Physical Committee. Only the LBMA chief executive and its independent technical consultant have access to the complete data set.)

13 January: The Expanded Panel

Over the past two years the testing of the applicant referees and the samples that they have produced has been exhaustive (and, at times, exhausting). In the case of gold alone,

7,319 fire assay trials (plus additional instrumental analyses) have been carried out. But it is a source of satisfaction to all concerned that, at the conclusion of this work, the group of applicant referees as a whole is now able to demonstrate the kind of precision and accuracy in assaying required for their appointment as Good Delivery referees.

The LBMA will announce the identity of the expanded panel of referees on 13 January, to coincide with the official launch of the proactive monitoring scheme. ■

A batch of samples arrive in tamper-proof tubs at a cross-checking laboratory for assay.

