[2008-11-23]**Will aero engine makers be tempted back into Ruthenium now that the spike is over?**

Producers of Ruthenium missed an opportunity over the last two years when they ignored the demands of aero engine companies who were looking to conclude 5 year fixed price contracts for the metal.

It was the NASA Joint Development Project, launched in 1996, which concluded that a new generation of Nickel base alloys for the high pressure turbine containing Ruthenium 3% together with Rhenium 6%, was the next step up to optimize engine performance. Called 4th Generation alloys, the 50°C operating temperature increase would help aero engine companies demonstrate to law-makers that they were doing all they could to reduce emissions to the upper atmosphere, whilst at the same time reducing airline fuel bills.

Nor is it too far fetched to suppose that a large part of the much-vaunted claims of 40% environmental savings promised by Boeing for the 787 Dreamliner were to be achieved through the better operating temperatures of the launch engine – the Rolls-Royce Trent 1000. And perhaps some of the delay in the launch can be attributed to problems of obtaining long term Ruthenium to make the great alloy leap forward.

The problem was that, just as aerospace commercialization was about to take place, the market for Ruthenium, with a total supply of not much more than 30 mt per year, found itself competing with strong demand from the electronics industry. Just as aerospace was poised to come in, Hitachi and other target-makers were commercializing the use of Ruthenium for High Density Data Storage (HDD) and, unlike the aerospace people, the data industry's demand was immediate. It is thought that the market expanded by about a third in the last three years and as much as 20 mt per year Ruthenium is now used in this field.

The ironic thing was that in 1996 when the Joint Development Programme was launched Ruthenium was around the $40-50 per toz level. As we approached 2000 it spiked to about $180 per toz but was back to $50 per toz when the programme ended. But the alloy was still an invention waiting for a use, so no one took on stock. Then, between 2006-2007, the price went all the way from $50 to $900 per toz. It is not a coincidence that this was a period which saw Deutsche Bank, Credit Suisse and others enter the platinum group markets in a very big way for clients. It was an amount of speculation never seen before in this field and provides one of the best arguments, if any are needed, as to why minor & precious metals should not be attracting participants from outside the metal trade. It is an argument that needs repeating time and again now that the LME seems bent on setting up Molybdenum and Cobalt contracts. For it could be argued that the non-commercialization of Ruthenium in proven technology could be blamed on this irresponsible speculation.

Today, with the credit crunch removing non-trade money from platinum group markets, Ruthenium has returned to levels, around $150-200 per toz that would once have been a highly attractive entry point for engine makers and super alloy melters.
So will the engine makers be tempted back? And are there lessons to be learned on all sides about how metals for new applications should be sourced?

Certainly, Lonmin, Anglo-Plats, Impala & Northam would surely now wish that they had not discouraged so important an industry by not entering long term agreements when the going was good. But, at the same time, aero engine people need to learn that minor or precious metals cannot simply be bought off-the-shelf. Perhaps, indeed, were it not for the false Harvard Business School just-in-time mantra of not taking on stock, most aero engine makers would have started their stock-building programme years before they actually needed to start melting the stuff.

The choice for aerospace now is stark. They know that an alloy exists which allows them the design space to achieve greater efficiencies needed on both environmental and efficiency grounds but they also know, with Rhenium in mind, how hard it is to design out a key element once it has an established place in a modern gas turbine engine. Do the engine makers want to risk another Rhenium; exposing themselves to another market which may just be too small and illiquid to allow them to plan solidly for the future? But on the other hand, can they do without it? Whether there is to be a third runway at London's Heathrow or not, yet another EU directive is lumbering along in the not too far distance which will have wide reaching implications for aircraft emissions – the European Air Quality targets which are due to become law in 2010. Perhaps it is a question of comply or die all over again?

My unbiased suggestion to both parties is that this could be a good time to talk.