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TANTALUM-NIOBIUM INTERNATIONAL STUDY CENTER

PRESIDENT'S LETTER

Friends,

The month of December is often a time of reflection. We look back at the past year filled with its trials and tribulations and forward to the New Year to come. Throughout this year the membership of the T.I.C. has continued to grow from strength to strength and the organisation prospers due to the efforts of its members and dedication of its staff. High amongst those contributions has been the stewardship of Dave Reynolds as President. I would like to take this opportunity to thank him on the behalf of all of the members for his professional and personal contributions in making this yet another successful year in the life of the organisation. Under Dave's leadership and in collaboration with its members through the Executive Committee and the Office of the General Secretariat and staff we can look back at the past year with some satisfaction. It was delightful to bask in the warmth of the reaction and positive feedback from its members to the Philadelphia meeting, its organisation, social activities, the papers delivered and the tours provided. I would also like to take this opportunity to thank the staff and people of Reading Alloys for their efforts in making what was by common consensus one of the most enjoyable plant tours.

We look forward to building upon these successes in the New Year and I would appeal to our members to submit papers for this Symposium year to come and help further the interests of our industry and its people. This is an excellent way through which the organisation can truly reflect the interests, aspirations and concerns of its members as well as to inform.

Finally I would wish you all the Season's Greetings and look forward to another year of opportunities and challenges.

*Bill Millman
President*

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TANTALUM AND NIOBIUM WORLD

International Symposium
October 16th to 20th 2005
Pattaya, Thailand

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PHILADELPHIA , OCTOBER 2004

GENERAL ASSEMBLY

The Forty-fifth General Assembly of the association was held in Philadelphia, U.S.A. on Monday October 11th 2004, as part of a meeting from October 10th to 12th.

The Charter of the association was amended, to reflect the provisions of the Belgian law governing international associations, which had recently been changed, and to bring the statutes up to date.

Mr David Reynolds, Kemet, completed his year as President, and the assembled delegates thanked him warmly for his service to the association.

Mr William Millman, AVX, was elected as President for the coming year.

Mr Thomas Odle and Mr David Paull had resigned from membership of the Executive Committee. Mr Michael Tamlin, Sons of Gwalia, and Mr William Young, Cabot Supermetals, were elected to the Committee. The other members of the Committee were re-elected to serve a further term: Mr Tadeu Carneiro, Dr Josef Gerblinger, Mr He Jilin, Mr Michael Herzfeld, Dr Axel Hoppe and Mr David Reynolds.

The General Assembly accepted the applications of five new member companies, and the resignation of one member, bringing the number of members to 85. The audited accounts and the budget for the coming year were approved.

The General Assembly in 2005 will be held on October 17th, during the Symposium in Pattaya, Thailand.

TECHNICAL PROGRAMME

The technical presentations were of a notably high standard at this meeting. The following papers were presented:

Report on the work of the T.I.C. Transport Committee
William A. Serjak, Technical Promotion Officer
Tantalum-Niobium International Study Center

The Defense National Stockpile Center's tantalum sales

Cheryl Deister, Director, Contracting, Defense National Stockpile Center, Defense Logistics Agency

Tantalum powders for high voltage applications

Leah F. Simkins, Michael J. Albarelli, Kathleen B. Doyle and Bonnie Cox
H.C. Starck

Niobium for high-temperature applications

Tadeu Carneiro, Vice President
Reference Metals Company

Recent advances in tantalum mill products for physical vapour deposition

Peter Jepson, Rich Malen and Prabhat Kumar
H.C. Starck

The usage of tantalum for physical vapour deposition applications

Michael W. Morris
Cabot Supermetals

Some problems of yttrium-refined tantalum production

S. Dobrussin, Yu. Gulyaikin, G. Gyintsev, V. Shevlyakov
NAC Kazatomprom, Ulba Metallurgical Plant JSC

Tantalum coated materials for surgical implants

Bo Gillesberg
Danfoss A/S

Challenges involving deposition of counter-electrode systems in high charge ($\leq 100k$ CV/g) tantalum powders

Eric Zediac, Chris Coker, John Moore
KEMET Electronics

How far can we go with high CV tantalum capacitors?

Yuri Pozdeev Freeman
Vishay Sprague

The first two papers appear in this Bulletin, and a selection of the other available papers will be printed in the next few issues.

READING ALLOYS

On Tuesday October 12th a party of almost one hundred delegates went to Robesonia to tour the metallurgical plant of Reading Alloys, by kind invitation of the company. A series of introductory talks by experts from the company explained the work undertaken by the company and the processes which the visitors would see. The group also had an opportunity to see an exhibition set up to illustrate the products made, ranging from rough ingots to a model of an aircraft turbofan engine which incorporated alloys originating at Reading. Visitors were impressed by the thermite reactions: every few minutes a fresh batch of alloy emerged from the engulfing flames as the exothermic reaction proceeded and died away. They saw the subsequent inspection and quality control which are essential features when the eventual end-product is a jet engine component – lives depend on it.

After lunch in a former factory in Reading, converted into a comfortable restaurant, the group returned to Philadelphia at the close of the meeting.

SOCIAL PROGRAMME

The technical sessions were held at the Sheraton Society Hill Hotel, where all the participants were guests of the T.I.C. at the welcome reception in the indoor Courtyard and also at the gala dinner. The hotel ballroom was transformed for the occasion into a 1930's jazz club, the dark background contrasting with

bright candles and colourful orchids. The guests were entertained by a talented jazz band and singer, and by the lively Philadelphia Mummies, with their sparkling, kitsch costumes and tuneful playing.

REPORT OF THE T.I.C. TRANSPORT COMMITTEE, OCTOBER 2004

This report was given in the technical session of the T.I.C. meeting in Philadelphia, October 2004, by Mr William Serjak, Technical Promotion Officer, T.I.C.

In 1996 the International Atomic Energy Agency (IAEA) published document TS-R-1. It was revised in 2000 and the current version is TS-R-1 (ST-1, Revised). TS-R-1 contains the regulations for the transport of naturally occurring radioactive materials (NORM), minerals which contain radionuclides. TS-R-1 gave an upper limit of 7 Bq/g for classification of materials as non-hazardous, with a 10 x exemption for NORM materials which would be processed for their content of metals other than uranium or thorium (thus the limit was 70 Bq/g). The regulation was not clear in the interpretation as to whether this meant the radiation from uranium and thorium only or also meant the radiation from the two parent elements and their progeny in the decay chain. The most common interpretation was for the parent elements only and, therefore, there were no problems with the transport of tantalum raw materials. The revised regulation was clearer. It changed the limit to 1 Bq/g (again with the 10 x exemption for NORM) and was specific that it did not include the progeny. The activity of the progeny of uranium and thorium, in equilibrium, is about seven times that of the uranium and thorium parents.

The IAEA writes and proposes regulations, but its regulations only become effective when they are accepted and adopted by each individual country. The acceptance and adoption can be different in each country. The agency within each country that is responsible for the coordination of the acceptance and adoption is the Competent Authority. Individual countries may adopt the regulations or modify them to suit their own needs. Some are very strict and some are much less strict. The Competent Authority is the organization which communicates with the IAEA and its own country's government and with the organizations, companies and people affected by the regulations that govern the transport of radioactive material. For example, in the U.S. it is the Department of Transportation, in the U.K. it is the Department for Transport, and in Australia there are thirteen Competent Authorities, including ARPANSA. Because implementation of the regulations is carried out by the Competent Authority in each country, the regulations are not all implemented worldwide at the same time. Thus, as more and more countries adopted the new regulations they began to include nearly all the material carried between countries. T.I.C. members began to see increasing problems with the transport of raw materials over the past one to two years.

The new regulation was intended to be slightly less restrictive than the old regulation, but that depended on the interpretation of the old regulation. Although a certain amount of tantalum ores fall into the category of 'Class 7, hazardous goods', we believe that the majority of tantalum raw materials should not be classified as hazardous. Handling of material classed as hazardous has problems:

**www.tanb.org
e-mail to info@tanb.org**

1. Some countries will not allow Class 7 materials into their countries or be handled in their ports
2. Some carriers will not carry Class 7 material or will not visit ports if the only cargo is Class 7
3. Some carriers will not carry Class 7 with other types of materials such as electronic equipment or other "sensitive" goods
4. The world's economies are in a very high growth cycle and there is a shortage of carriers. Carriers can now be more selective with their cargoes.

When carriers perceive tantalum raw materials as being hazardous, the companies which want to ship the materials encounter such problems. In 2003, when T.I.C. member companies requested quotations from carriers to transport tantalum raw materials, they found that some carriers did not respond, some said they did not want to carry our raw material, and some quoted prices that were very high. Thus, the carriers were effectively refusing to carry the ore without "officially" denying shipment of tantalum ores.

Because the tantalum industry was poised to recover from the downturn of 2001 and 2002, a solution to this problem was needed before even more difficulties ensued. The possibility of a raw material shortage caused by an outside agent, such as a lack of carriers, could cause some end users to seek substitutes.

The Transport Committee worked out the following approach to the problem:

1. Make the IAEA aware of our problem and seek relief
 - a. Gather radioactivity data for shipments by members
 - b. Write a position paper
 - c. Present position paper to Competent Authorities
 - d. Have Competent Authorities understand/acknowledge our problem
2. If successful, as measured by the IAEA positive response
 - a. Accurately determine the hazardous nature of our raw material, if any
 - b. Determine the hazard to transport workers and the general public
 - c. Prepare for a Coordinated Research Project (CRP) by the IAEA
 - d. Have the IAEA change the regulations to classify tantalum raw material as non-hazardous

During this project the Transport Committee invited the T.I.C. member companies to collect data on denial of shipments and to send it to their Competent Authority. Several members participated. The IAEA seemed unaware that our denial of shipments problem existed. The denial of shipments of tantalum raw materials does not make headlines. The IAEA was aware that shipments of many radiopharmaceuticals and scientific radioactive materials were being denied or delayed.

We also asked T.I.C. members to submit to the T.I.C. auditors the measurements of the radioactivity and the dose rates of the ore that they had shipped "recently". It is very important for all T.I.C. members to understand that these data are handled in the same manner as the T.I.C. statistics. Confidential and anonymous! There were many assumptions that we made about the data.

1. The data would not represent all shipments of tantalum ores
2. The data might be biased
3. The testing may not have been done by independent companies
4. Testing might not have been done systematically, with consistent rules or with calibrated equipment

5. We would not know how much duplication there would be in the data
6. We did not know the source of the raw material

With these limitations in mind, we reviewed the data from the T.I.C. members and began to write our position paper which asks the Competent Authorities for relief from the regulatory designation of Class 7 hazardous material. The position paper was distributed to Competent Authorities and they were asked if they would bring our request to the next appropriate meeting of the IAEA and support our position to reevaluate the new regulation on classifying tantalum ores as hazardous. We receive positive responses from: United Kingdom, Germany, South Africa, Australia, Brazil, Canada and the United States.

We also accepted an official invitation from the US Competent Authority, the Department of Transportation, to comment on the changes to TS-R-1. We attended a Fact Finding Forum held by the IAEA in London to present our position on transport difficulties and denial of shipments. In both cases, our position paper and comments were accepted. In September, three of our members attended the International Symposium on Packaging and Transportation of Radioactive Materials meeting in Berlin. We were unofficially told that we were on the right track and we were thanked for our response.

The members of Competent Authorities are most concerned about the denial of shipments. They are very concerned with the slowing or stoppage of commerce within or between countries. After all, their job is to keep this commerce moving. We also asked the IAEA 'Do you really want tantalum raw materials in the system meant for radioactive materials?' This could be a deciding factor for the IAEA. As a note, there seemed to be few other industry groups which were concerned with this problem.

Some members of the IAEA TRANSSC (Transport Safety Standards Committee) seem to be in favor of a Coordinated Research Project (CRP). The CRP would study tantalum and other raw materials and make an informed judgment on their hazardous nature. The Transport Committee took the proactive position to set up a program to test tantalum raw materials and evaluate their hazardous nature. In order to do this we prepared a Request for Quotation for the testing. RFQ's were sent to consultants and testing companies during the week of September 17th. We expect to have responses by the Committee meeting on October 13th.

Unfortunately, the cycle of the IAEA action is not fast. From the time IAEA finalizes a regulation until the time the regulation is revised or removed a period of two to eight years may elapse. After complying with the regulations for two to eight years, there usually is little advantage in having the regulation overturned. But, there are times when the review of a regulation can be expedited. When we were told the IAEA might institute a CRP, we decided to proceed as though the CRP was a fact.

In order to determine if tantalum raw materials present a hazard to the transport workers and the general public, we need to:

1. Test the radiation of tantalum raw materials being shipped.
2. Test the radiation dose rate of the material and determine if it meets acceptable limits or presents harm to those who come into the proximity of the material during transport. This would include the possible inhalation hazards if the material were to be involved in an accident and escape all containment.
3. Have a report that summarizes the testing and evaluates all hazards of the material.

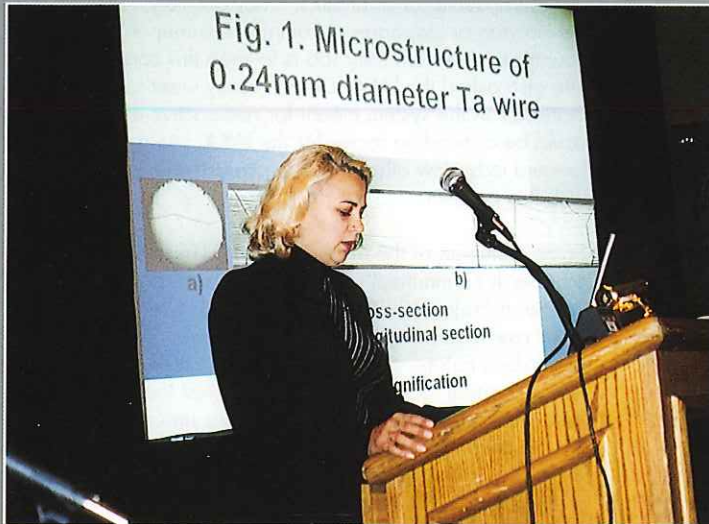
Technical Session, Philadelphia



Peter Jepson, H.C. Starck
Session chair: Tadeu Carneiro



Michael Morris, Cabot Supermetals



Vlita Demina, NAC Kazatomprom/Ulba



Yuri Pozdeev, Vishay Sprague
Session chair: Axel Hoppe

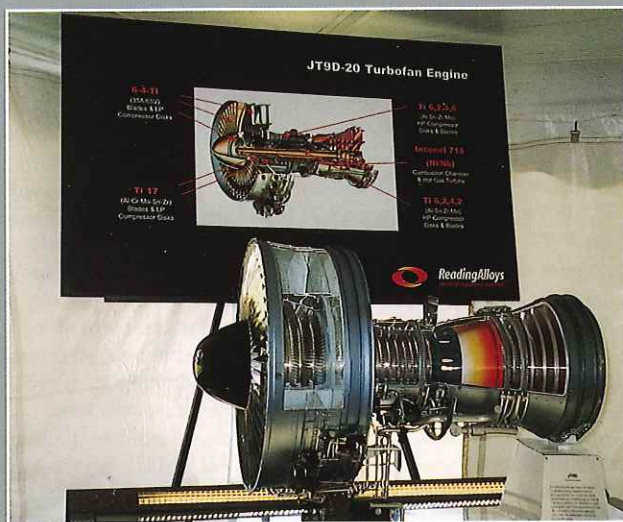


Tadeu Carneiro, Reference Metals/CBMM

Plant Tour



Briefing by ReadingAlloys



Aircraft engine with niobium alloy components



Brian Higgins of ReadingAlloys (in sunglasses) welcomes T.I.C. President Dave Reynolds (in light jacket)

Gala Dinner



Philadelphia Mums

The ladies



Photographs:
Fernand Cyrux
JW

4. Have testing and a report made by a reputable consultant whose work is recognized by the IAEA.

The next step will be to receive and evaluate the quotations for the testing and report. We expect to contract the testing in November so the final report can be ready for the Executive Committee meeting in Brussels in April 2005.

The few words on this paper do not describe the amount of effort by the Transport Committee members. The nearly weekly telephone conference meetings have been very well attended. All members have contributed their time, energy and ideas to make the Committee's work successful.

Members of the Transport Committee of the T.I.C. are*:

Ken Hunt, Cabot Supermetals
 Ernst-Joachim Martin, H.C. Starck
 Christian Polak, A & M Minerals and Metals
 David Reynolds, Kemet Corp., President T.I.C.
 Ulric Schwela, Alfred H. Knight International
 William Serjak, Technical Promotion Officer, T.I.C.
 Michael Tamlin, Sons of Gwalia
 Judy Wickens, Secretary General, T.I.C.

Their contributions have been extraordinary.

A copy of the position paper is available from the T.I.C.

*Note: Mr William Millman has joined the Committee, as President of the T.I.C. for the current year, and Mr Reynolds has retired from an active role in this Committee; Mr Polak has left the Committee at the end of November.

THE DEFENSE NATIONAL STOCKPILE CENTER'S TANTALUM SALES

This paper is based on the presentation made at the Philadelphia meeting of the T.I.C. by Ms Cheryl Deister, Director, Contracting, Defense National Stockpile Center

The Defense National Stockpile Center is part of the Defense Logistics Agency of the United States, and sells commodities on the open market. The purpose of establishing this stockpile of strategic and critical materials was to reduce U.S. dependence on foreign supply sources during national emergencies. The DNSC currently stores 47 commodities, valued at \$US1.7 billion, at 41 locations. Website: <https://www.dnsc.dla.mil>

For sales from the Stockpile, the law says that competitive sales procedures should be used. So the DNSC can and does accept bids from both U.S. and non-U.S. concerns, and occasionally from a foreign government. The law also requires that the sales should 'avoid undue disruption of the usual markets of producers, processors and consumers', and also should 'protect against avoidable loss'.

The Defense Authorization Acts give general authority to sell commodities, and each year an Annual Materials Plan (AMP) is established, setting specific annual sales ceilings for the period from October 1st to the following September 30th.

The Market Impact Committee advises on the Annual Materials Plan, giving advice to the Stockpile manager on U.S. and non-U.S. economic effects of proposed acquisitions and disposals of stockpiled materials. Members are chosen for their expertise on materials and markets that could be adversely affected by Stockpile acquisitions and disposals, and come from the

Departments of State and Commerce (Co-Chairs of the Committee), Agriculture, Defense, Interior, Treasury, Energy and Homeland Security. The Committee regularly consults with representatives of producers, processors and consumers of the materials that could be affected by the AMP.

Tantalum minerals were purchased in the 1970's from various countries including Brazil, the former Belgian Congo and Portugal, packaged in burlap bags, in drums and in kegs. Other forms of tantalum were acquired in the 1990's from various U.S. and international sources. The tantalum inventory as of September 30th 2004 is shown in Table 1. The Stockpile also contains 560 000 lbs columbium (niobium) in concentrates and 20 000 lbs of columbium ingots.

Form	Quantity (lbs Ta)
Minerals	1 118 885
Metal powder (capacitor grade)	34 607
Metal ingots (vacuum grade)	20 388
Carbide powder	12 158
Oxide	40 865

Table 1: Tantalum inventory of Stockpile, September 30th 2004

The largest quantity of minerals is at Warren, Ohio, where 550 135 lbs tantalum are stored; 11 464 lbs metal powder and 1687 lbs carbide powder are in the same location. 266 185 lbs tantalum are in minerals in Binghamton, New York, along with 20 388 lbs metal ingots, and 256 575 lbs tantalum in minerals are in New Haven, Indiana, together with 2115 lbs carbide powder and 40 865 lbs tantalum in oxide. Scotia, New York, is the site of 45 990 lbs tantalum in minerals, while 23 143 lbs metal powder and 8356 lbs carbide powder are situated in Somerville, New Jersey. Minerals are stored in unlined drums, powder in wide-mouth one-quart bottles, metal ingots are in 'environmentally safe cradles', while carbide powder is in wooden boxes containing six drums each. (Details of quantities and packaging are given in DLA-TANTALUM-001, on the website, 'Pages 1 to 3 of 151'.)

The sales programme for tantalum as stated in the Annual Materials Plan is shown in Table 2. The period FY04 refers to fiscal year October 1st 2003 to September 30th 2004, and FY05 to October 1st 2004 to September 30th 2005.

Form	FY04 AMP (lbs Ta)	FY05 AMP (lbs Ta)
Minerals	500 000	500 000
Metal powder (capacitor grade)	40 000	40 000
Metal ingots (vacuum grade)	40 000	40 000
Carbide powder	4 000	4 000
Oxide	20 000	20 000

Table 2: Materials for sale in fiscal years FY04 and FY05, according to the Annual Materials Plan

The amounts of materials sold in fiscal year 2003 (October 1st 2002 to September 30th 2003) are shown in Table 3. Total revenue in FY03 was \$US9.6 million, and in FY04 was \$US16.8 million. Sales of ten commodities, including tantalum and columbium materials, were suspended in June 2004 as receipts from sales had reached a statutory revenue ceiling. Resumption of sales was dependent on legislative authority (authorization to resume sales was granted, with effect from November 15th 2004).

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 The T.I.C. is an association internationale under Belgian law.

Form	FY03 AMP (lbs Ta)	FY04 AMP (lbs Ta)
Minerals	438 776	355 555
Metal powder (capacitor grade)	2 168	38 460
Metal ingots (vacuum grade)	40 467	39 772
Carbide powder	0	0
Oxide	0	20 456

Table 3: Materials sold in fiscal years FY03 and FY04

The sales strategy for tantalum materials has two strands: spot sales and long term sales. Under the Basic Ordering Agreement (BOA) spot sales can be made once a week. All forms are offered, and the form and quantity on offer are posted on the DNSC website (<https://dncs.dla.mil>) on Thursday by 11.30a.m. (local time, Fort Belvoir, Virginia); potential customers may post quotes up to the following Monday at 11.30a.m., and awards are made on Wednesday, two days later. Long term sales on a negotiated basis are only used for tantalum minerals needing a licence from the Nuclear Regulatory Commission (Category 2 minerals with 0.05% or more by weight of uranium or thorium or both); multiple awards can be made, and a condition is that the materials must be removed within one year.

Under the BOA system, information on quotes offered by potential buyers is not released to the public. There are some pre-negotiated terms, and companies wishing to participate must register in advance by completing the relevant forms and supplying requested information. Interactive submittals are accepted. After a sale has been agreed, only aggregate or provisional contract amounts and a company name will be made public, not full details. Advantages of the BOA system, as the DNSC sees them, are its flexibility and its responsiveness to the market, the frequency with which material is offered, and the way in which offerings can fill a 'spot' need in the marketplace. The DNSC selects the quantity and quality of material being offered. The companies making offers have pre-qualified, and terms and conditions have been established beforehand, which makes the process more rapid.

An executed copy of the Basic Ordering Agreement and the Quote/Award Form (I.1) taken together will constitute a contract. (Form I.1 can be found as 'Page 31 of 151' on 'DLA-TANTALUM-001', on the BOA section of the DNSC website, following sections A to H.)

To use the BOA system, companies may register and qualify at any time, pre-qualification is 'an on-going process'. (Information and forms are found by clicking on BOA Sales, then Tantalum on the menu which appears, then BOA on the Tantalum screen.) Applicants must review and agree to conform to the terms and conditions of the Agreement by completing pertinent sections of the BOA cover sheet (fourth page of BOA information), and also the identification sections I.4 through I.7 ('Pages 67 to 71 of 151'), as well as supplying the financial statements and references noted on 'Page 5 of 151' in 'Section B - Prequalification'.

The DNSC will examine the financial strength of a company to see if it can be considered responsible and eligible to be awarded some of the offered material, and will determine the financial exposure limit extended to the company (the maximum level of business which will be allowed). Financial position, past performance, references from suppliers or financial institutions, credit reports and financial risks will all be taken into account. If the company applying is deemed responsible, the DNSC Contracting Officer will sign the Agreement and return one copy to the company, with a letter of acceptance setting out the financial exposure limit and whether any special conditions have been granted. Only when acceptance has been confirmed is the company allowed to quote, to offer to buy DNSC materials.

If payment terms are requested, the DNSC will consider whether

it will accept, and will adjust the quoted price and also factor in 'the cost of money' when working out the period for repayment and the instalments to be paid.

The procedure of becoming qualified to quote must be renewed every year. It must also be renewed at any other time when circumstances change.

Payment by wire transfer is convenient and accelerates the release of the goods; full details for making a transfer are given on the website. Company or bank cheques (checks) are also accepted, again detailed instructions for sending the cheques are given. DNSC has under consideration 'automated/accelerated check processing'.

Successful purchasers are required to pay and to remove all material - except minerals - within 30 days of the awarding of the contract. For minerals, the period for paying and removing the goods is 90 days.

Ms Deister closed her presentation by asking her audience for feedback, particularly on the following topics: (1) sales methodologies - frequency of offers; length of time to formulate business decision; which form should be offered first; (2) pricing; (3) market conditions'.

DNSC may be contacted by telephone at these numbers:

+1 703 767 6500	General number
+1 703 767 5475	Ms Deister
+1 703 767 5497	Mr Talbott
+1 703 767 5487	Ms Iribarren
+1 703 767 5402	Mr Lough

Fax numbers are given on the website, and there is the possibility of sending e-mail through the website also.

DLA SALES HAVE RESUMED

Following the resumption of sales in fiscal year 2005, from November 15th 2004, offerings of materials are again posted on the DNSC website.

MEMBER COMPANY NEWS

The following companies were elected to membership by the Forty-fifth General Assembly:

DM Chemi-Met

Hesslewood Hall, Ferriby Road,
Hessle, East Yorkshire HU13 0LH, England.
Tel.: +44 1482 307 668 Fax: +44 1482 307 669
e-mail: daisy@alcomet.com

Mekios (UK) Ltd

Whittaker House, Whittaker Avenue,
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Surrey TW9 1EH, England.
Tel.: +44 208 822 6829 Fax: +44 870 220 3046
e-mail: sele.mekios@tiscali.co.uk

Metallurgical Products (India) P. Ltd.

T-27. MIDC, Taloja - 410208,
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Tel.: +91 22 2740 1853 Fax: +91 22 2740 1894
E-mail: mpil232001@yahoo.com

Plansee AG

A-6600 Reutte, Austria.
Tel.: +43 5672 600 2219 Fax: +43 5672 600 504
e-mail: eduard.kotz@plansee.com

Rittenhouse International Resources

P.O. Box 1829, New York, NY 10156, U.S.A.
Tel.: +1 212 726 0020 Fax: +1 212 726 0060
e-mail: rittenhouseir@verizon.net

Mamoré Mineração e Metalurgia has resigned from membership.

AVX

The AVX Tantalum Division received the Medtronic Supplier Excellence award in recognition of the quality of its capacitors. AVX Corp. was also 'Number one in tantalum and niobium-oxide capacitors worldwide in 2003' according to Paumanok Publications' Dennis Zogbi (see AVX website for article).

AVX/Cabot

Cabot Corporation announced on November 22nd 2004 that a ruling from the United States District Court had granted its motion to dismiss a complaint filed against it by AVX, alleging that Cabot had violated federal antitrust laws by tying the purchase of one type of tantalum products to the purchase of other types. Throughout the litigation, AVX continued to purchase product in accordance with the terms of its supply agreement.

Cabot Supermetals

Parent company Cabot Corporation announced on October 27th 2004 earnings of \$15 million for the quarter ended September 30th 2004 compared to \$28 million for the same quarter in 2003. The Cabot Supermetals share of the year's earnings (\$124 million) was \$22 million, a decrease of \$5 million compared to the previous year.

In a webcast on September 15th, Cabot Corporation Chairman Mr Kennett Burnes said that Cabot would be interested in buying the Wodgina mine of Sons of Gwalia. Cabot had a supply contract running until 2010, secured through a mortgage arrangement, he said.

Sons of Gwalia

The Greenbushes and Wodgina mines owned by Sons of Gwalia (in voluntary administration) 'contain the majority of the world's known reserves of tantalum and between them in 2004 will produce and ship in excess of 2.2 million lbs of tantalum in concentrates', business continued as usual and all supply contract obligations would be met, confirmed company representatives in October.

On October 14th the administrators of Sons of Gwalia announced that they had appointed advisors to 'assist in reviewing options for the reconstruction, sale or otherwise' of the major assets of the company. UBS Investment Bank was appointed to advise on the 'Advanced Mineral Business and Tantalum Assets'. Macquarie Bank would advise on the sale of the gold assets, expected to be offered for sale 'in the very near future'.

On November 29th Sons of Gwalia (Administrators Appointed) and H.C. Starck announced agreement on a new long-term take or pay tantalum supply contract. Following the end of the present contract in December 2005, the new contract provided for the supply of tantalum concentrates for the calendar years 2006 to 2008 inclusive, with commitment for a minimum of 800 000 lbs per annum and an option for the buyer to take a further 200 000 lbs per annum.

At the same time the administrators confirmed their approval of capital investment programmes at both Greenbushes and Wodgina. The development of the underground mine at Greenbushes would be started again, anticipated to produce approximately 500 000 lbs Ta₂O₅ per annum. Full production

would be reached over 18 months, and A\$10 million would be invested as new capital expenditure. Full production capacity at Greenbushes, with both underground and open pit sources, was expected to be about 1.1 million lbs annually, and a further 200 000 lbs would be sourced from other operations in Western Australia. Improved recoveries and throughput at the Wodgina mine would maintain production capacity at 1.3 to 1.4 million lbs per annum; the upgrade would take place over 12 months at a cost of A\$8 million.

The Administrators announced on December 1st 2004 that they had received approval from the Courts to extend the convening period for the second meeting of creditors to April 30th 2005, and this period might be extended further to June 30th or later, under given conditions. This allowed the administrators to address the size and complexity of Sons of Gwalia's operations and financial position. A written report would be issued to creditors by December 17th 2004.

Haddington Resources

Haddington intended to use part of the funds raised from a rights issue announced on November 23rd to 'expedite exploration of its wholly owned tantalite exploration areas in an effort to establish its own independent resources while continuing its production commitments to Sons of Gwalia from the Bald Hill Mine'. Another part of the funds would be used to install and re-commission equipment recently acquired, with a view to upgrading its concentrates for sale into the global market and becoming an independent tantalite supplier.

Kemet

In the quarter ended September 30th 2004, Kemet reported a net loss, which Dr Jeffrey Graves, Chief Executive Officer, put down to negative impact by an inventory cycle, especially at distribution customers which represented about half of the company's revenue. Although information from customers indicated that this was not a 'prolonged slump', the December quarter was not expected to be better than the September quarter. The effort to move production to low cost regions of the world continued, and a further 10% decrease in the workforce in the next few months was foreseen.

Tantalum Australia

The first shipment of concentrates to China had left Tantalum Australia's Balcatta site in October, the company announced. The concentrates were 'derived predominantly from Tantalum Australia's Western Australian projects' and were being shipped to a major Chinese tantalum refiner, reported the company.

On November 10th Tantalum Australia announced that it was 'reviewing options to acquire' the tantalum assets of Sons of Gwalia. An issue of shares was planned, to provide funds to cover costs associated with the proposal concerning Gwalia, and on November 15th the share issue was announced.

Vishay Sprague

Dr Felix Zandman, Chairman and CEO of Vishay Intertechnology, announced a 10% increase in sales for the third quarter of 2004 compared to 2003. Bookings in the quarter were significantly below expectations, commented Dr Zandman, due to 'deteriorating economic conditions for the components industry', resulting in reduced orders from distribution. Nevertheless a broad product line and new product introduction, among other measures, would enable Vishay 'to continue to grow'.

On November 22nd Dr Zandman, co-founder of Vishay in 1962, transferred the CEO position to Dr Gerald Paul, and continued to serve as Chairman while assuming the new positions of Chief Technical Officer and Chief Business Development Officer.