TANTALUM-NIOBIUM
INTERNATIONAL STUDY CENTER

Presented at the Fifty-seventh General Assembly of the Tantalum-Niobium International Study Center (T.I.C.)
Toulouse, France, 16th-19th October 2016
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Email: liulihua@otic.com.cn Website: www.otic.com.cn
President’s Letter

Dear Fellow Members and Friends,

It is with great pleasure that I welcome you to the first Tantalum-Niobium International Study Center annual review released under the direction of our new Director, Roland Chavasse. I also heartily welcome you to Toulouse, France for our 57th General Assembly.

Hopefully, over the last couple of years, you’ll have seen significant changes to our organization and how it’s managed. However, we are constantly seeking to improve and can only do so with your help, particularly your ongoing involvement. This can range from simple suggestions, criticisms, and recommendations to being willing to serve on our various sub-teams and the Executive Committee.

This 2016 annual review highlights some of the initiatives we have undertaken and have underway since our meeting last October in Penang, Malaysia. Our organization has a rich history in trying to serve the needs of our members specifically and the tantalum and niobium industries in general.

In this booklet, you will find details on our current corporate members, with more to hopefully be elected in Toulouse. In addition, you will find biographies of the authors of the presentations planned during our technical sessions at the General Assembly.

Finally, I would like to thank our members who have sponsored this annual review through their advertisements. More importantly, however, I would like to recognize and appreciate the many contributions of our members, our T.I.C. staff, my fellow Executive Committee members, and particularly all our corporate members who have made this organization what it is today and hopes to become in the future.

Sincerely yours,

David Henderson
About the T.I.C.

Since its inception in 1973, the Tantalum-Niobium International Study Center (T.I.C. or the Association) has grown and developed to encompass the changing nature of the tantalum and niobium industries and will continue in the same spirit in facing future challenges. After initially focusing on just tantalum, in 1986 niobium joined the association and today our membership represents every aspect of the global tantalum and niobium industries.

The Association

• An international, non-profit association founded in 1974 under Belgian law.

• Around 90 member companies from 25 countries involved with all aspects of the tantalum and niobium industry supply chain (including mining, trading, processing, recycling, metal fabrication, capacitor manufacturing, medical...).

• The Association is run by its Executive Committee. This Committee reflects the range of activities of the members and covers the geographic spread of the membership too. Presidents have been drawn from all sectors of the industry and from many parts of the world. Elections are held annually.

• The T.I.C.’s office is led by the Director, who is supported by the Technical Officer and the Secretary General.

Objectives

• Increase awareness and promote the remarkable properties of tantalum and niobium in all their forms.

• To disseminate information on any matter affecting that industry, excluding price and related information and any other proprietary information.

• Address major issues and challenges facing its industry such as conflict minerals legislation, artisanal and small-scale mining (ASM), and the transport of naturally occurring radioactive materials (NORM).

• Organize a General Assembly of the membership in October each year for business and technical presentations. Typically, the location is chosen to allow a tour of a member company or an associated industry facility.

• Publish a quarterly Bulletin newsletter containing interesting and informative articles about the T.I.C. and the global tantalum and niobium industries.

• Collect statistics from member companies (via an independent company to ensure confidentiality) on tantalum and niobium production, shipments and consumption. Participating members receive quarterly statistics updates.
The Executive Committee is drawn from the membership and committee members may be, but need not also be, the delegates of member companies. The Executive Committee named here was approved by the T.I.C. members at the Fifty-sixth General Assembly and consists of (in alphabetical order of member’s surname):

- **Conor Broughton**
  conor@amgroup.uk.com
- **John Crawley**
  jcrawley@rmmc.com.hk
- **David Gussack**
  david@exotech.com
- **Dale Gwinnutt**
  dalegwinnutt@elitematerial.com
- **David Henderson (President)**
  dhenderson@rittenhouseir.com
- **Marc Hüppeler**
  marc.hueppeler@hcstarck.com
- **Jiang Bin**
  jiangb_nniec@otic.com.cn
- **William Millman**
  bill.millman@avx.com
- **David O’Brock**
  d.obrock@neomaterials.com
- **Candida Owens**
  candida.owens@btinternet.com
- **Daniel Persico**
  danielpersico-rc@nec-tokin.com
- **Alexey Tstorayev**
  tsorayevaa@ulba.kz

The Executive Committee meeting in Amsterdam, The Netherlands, April 2016.


**Election to the Executive Committee**

On Monday October 17th 2016 at the General Assembly of the T.I.C. in Toulouse, France, there will be elections to select the members of the Executive Committee that will stand for the period until the next General Assembly in October 2017. There is a maximum of twelve members, according to the Charter of the association.

**Sub-teams 2015-2016**

Sub-teams are advisory groups of T.I.C. members with expertise in particular fields. Sub-teams are tasked by the Executive Committee with specific projects. The Director sits on all sub-teams. In September 2016 the following sub-teams were operational:

**Marketing:**
- Ian Margerison (Chair)
- Fabiano Costa
- Steve Krause
- Daniel Persico
- Larry Stryker
- Emma Wickens

**Meetings:**
- David Gussack (Chair)
- Conor Broughton
- David Knudson
- David O'Brock
- Emma Wickens

**Supply Chain:**
- John Crawley (Chair)
- Conor Broughton
- David Henderson
- Marc Hüppeler
- Raveentiran Krishnan
- Jean-Paul Meutcheho
- William Millman
- Candida Owens

**Statistics:**
- Alexey Tsorayev (Chair)
- David Knudson
- Kseniya Solomina

We are always looking for enthusiastic T.I.C. members to join our range of sub-teams. If you are interested, then don’t hesitate to contact the T.I.C.

**Officers of the T.I.C.**

Since the 56th General Assembly the role of Director has been created and the Technical Officer has changed. As at September 2016 the officers of the T.I.C. are:

**Director**
- Roland Chavasse
- director@tanb.org

**Secretary General**
- Emma Wickens
- info@tanb.org

**Technical Officer**
- David Knudson
- tech@tanb.org
The last 12 months have been a year of great progress for the T.I.C. as the Executive Committee’s strategy for growth and development that was set out at the 56th General Assembly in Penang, Malaysia, in October 2015 has started to become realised.

Key changes have so far included hiring a Director for the first time, creating a new website, developing a highly-secure statistics collection website and hiring a new Technical Officer. There are also several proposed further changes that will be considered by the members at the 57th General Assembly, notably an updated Charter of Association, an Antitrust Policy (see page 13) and an ASM Code of Conduct to replace the Artisanal and Small-scale Mining (ASM) Policy.

For further information on any aspect of T.I.C.’s current operations, or to suggest new opportunities or subjects, please contact the President, any member of the Executive Committee or staff.

Statistics
The statistics service provided by the T.I.C. has seen radical change during 2016 and is set to evolve further. To date the two significant changes have been the establishment of the dedicated Statistics Sub-team, led by Alexey Tsorayev, and the development of a bespoke highly-secure online database to collect members’ trade data.

On setting out his vision for the sub-team Alexey reminded members that reliable statistics cannot be achieved by the efforts of only a few member companies and he placed particular emphasis on the need for members to provide accurate and timely data to the independent coordinator.

The new statistics collection website (http://ticstat.millerroskell.co.uk:8080/) became operational in July 2016 and replaces the traditional email-based collection system. The new system allows members to directly report their data on an ultra-secure website created by Stratovation Ltd and hosted by Miller Roskell Ltd, the independent chartered accountant who since 2015 collects, aggregates and anonymises members’ data.

As before the T.I.C. has no access to an individual members’ data. The T.I.C. Technical Officer receives a report giving the aggregated, anonymised data that is then shared with participating members.
Supply Chain

In 2009, when the T.I.C. authored and adopted the original Artisanal and Small-Scale Mining Policy (ASM Policy) there was little consensus on how, or if, companies could ethically source material from ASM sources. Since then a great deal of legislation and regulation has come to bear on this subject. Due to the expansion of the regulatory framework, the Supply Chain Sub-team, led since April 2016 by John Crawley, has drafted an ASM Code of Conduct for T.I.C. members to consider as a replacement for the 2009 policy at the 57th General Assembly.

The Code of Conduct aims not to provide specific guidance to members, but rather to encourage members to comply with laws and best practices. It is important that our organization, and membership, avoid actions that damage the perception of our industry as such damage is detrimental to the T.I.C. promotion of tantalum and niobium consumption.

During the year the T.I.C. continued to sit on the Governance Committee of the iTSCi Programme and also participated in the OECD’s Multi-stakeholder Steering Group (MSG), the CFST’s tantalum sub-team and the Public-Private Alliance for Responsible Minerals Trade (PPA). Ulric Schwela’s former role as the Association’s Supply Chain Officer was transferred to the Director in February 2016.

Transport of NORM

It has been another busy year concerning the T.I.C.’s work on the transport of naturally occurring radioactive materials (NORM). This is a critical subject for the T.I.C. since many ore bodies containing tantalite also contain the radioactive elements thorium (Th) and uranium (U). While the radiation level of most tantalite shipments is below 10 Bq/g (and therefore qualify to be treated as general cargo) some carriers decide that the potential Class 7 classification of such shipments is commercially unattractive, resulting in denial of shipment (DOS).

This year the T.I.C. attended two stakeholder meetings at the International Atomic Energy Agency (IAEA) in Austria and continued to sit on both the IAEA Transport Safety Standards Committee (TRANSSEC) and Transport Facilitation Working Group (TFWG).

An introduction to the transport of NORM, including a guide to calculating radioactivity levels (in Bq/g), is currently in development.
Staffing
The Staffing Sub-team, chaired by William Millman, had a very busy year, first hiring the Director, Roland Chavasse, in January 2016, and then hiring the new Technical Officer, David Knudson, in July 2016.

The new role of Director was created to be the main interface between members and the Association. The role encompasses not only day-to-day management of the T.I.C. but is also to represent and promote the Association and its interests as and when required. In addition, the Director oversees matters relating to the supply chain of tantalum and niobium and, in particular, interacting with the OECD, CFSI and serving on iTSCi’s Governance Committee.

Roland has a background in both the specialty metals industry and trade associations. He was the first General Manager of the Minor Metals Trade Association (MMTA) in 2007-2011 and he also has 8 years’ experience working for the metal trading companies SFP Metals and Maritime House. Immediately prior to joining the T.I.C. he was a consultant at Roskill Information Services. Roland is based in London, United Kingdom.

The Technical Officer (TO) is a core member of the T.I.C. staff and advises on and ensures the execution of the T.I.C.’s technically oriented goals and strategies. The TO provides an appropriate and timely technical service to the tantalum and niobium community, that includes managing industry statistics and monitoring trends in the tantalum and niobium supply chains.

David Knudson, who will be based in Nevada, United States, replaced Ulric Schwela who left the Association after 11 years of outstanding service. David is a chemical engineer by training and has been in the tantalum industry for over 35 years. He started his career at Cabot Corporation’s Boyertown plant in Pennsylvania, United States, before joining Niotan Inc in Nevada, United States, in 2003.

On disbanding the sub-team in August 2016 David Henderson, T.I.C. President, thanked the Staffing Sub-team for their hard work on behalf of the membership and congratulated them for recruiting staff of the caliber that will deliver increased value to members and allow the Association to be more proactive and responsive to the needs of its members in the future.
Website
The T.I.C.’s website, www.TaNb.org, is both the Association’s main face to the public and, in the members-only area, a resource with vast potential for members. It was the aim of the Website Sub-team, led by Daniel Persico with Dale Gwinnutt and Emma Wickens, to create an interesting and informative site for both the interested public and the more technical-minded visitor. This policy appears to be working and since the new site went live in March 2016 visitor numbers have steadily risen.

Commissioning and building the new website formed ‘Stage 1’ of the website redevelopment and the new Marketing Sub-team (that absorbed the Website Sub-team in July 2016) has prodigious plans for the quantity and quality of resources that will be added to the website under ‘Stage 2’. If you have not visited yet, please do so and don’t forget to let us know how it can be improved further.

Looking ahead
There are a number of projects currently under development which will start delivering value in the foreseeable future, including:

- **Associate membership** has for many years been a semi-dormant category of T.I.C. membership and there have been no associate members since at least 2007. The Executive Committee believes that this is a lost opportunity to include a broader range of stakeholders in our community, thus strengthening it in the process.

- **Membership certificates** will be printed and issued for the first time from January 2017 onwards. Show your customers and staff that you are a proud member of the largest tantalum-niobium trade body in the world!

- **T.I.C.’s quarterly statistics reports**: we are looking at ways to enhance this service with the addition of non-T.I.C. sources of information, opinion and trade data.

- **The Bulletin**: Our newsletter has had a makeover and we are actively seeking contributors (regular or one-off) to keep the articles fresh, interesting and relevant. Please let us know your suggestions.

While the Executive Committee believes that the changes initiated since October 2015 will provide the T.I.C. with strong foundations on which to grow, members are urged to voice their feedback too; together we are stronger.

Roland Chavasse, Director
London, September 2016
Antitrust Compliance Policy*

* This policy has been proposed by the T.I.C.’s Executive Committee for members’ consideration prior to a vote to accept it (or not) at the Fifty-seventh General Assembly held on 17th October 2016.

**Purpose, Scope and Implementation:** The T.I.C. is fully committed to ensuring that all of its activities are carried out in full compliance with all applicable antitrust legislation. Failure to comply with this Policy may result in the association and/or its members violating antitrust legislation and being subject to the imposition of substantial fines or even criminal penalties for individuals.

**All T.I.C. employees, consultants and elected representatives** are under an obligation to conduct all business dealings in accordance with any applicable antitrust legislation. The T.I.C. employees, consultants and elected representatives must sign a written undertaking to the effect that they have read and understood the Policy and that they agree to adhere to that Policy in the conduct of their business activities.

**Members** are to ensure that any of their employees involved in T.I.C. activities and all those carrying out activities within the association on behalf of members are fully informed about the T.I.C.’s Policy. Applicant members will be asked to sign a statement to the effect that they have read and understood the T.I.C.’s Policy and that they will adhere to that Policy if admitted.

**T.I.C. activities.** Information concerning the Policy will be available on the T.I.C.’s website. All meeting agendas will be sent in advance of the meeting, and they will contain a statement to the following effect: “This meeting will be conducted in full compliance with the T.I.C.’s Antitrust Compliance Policy”. All chairpersons will be required to remind group members of the contents of the T.I.C.’s Policy on a regular basis. Minutes of the meetings will be distributed to the participants within a reasonable time after the meetings.

**Escalation of concerns.** All employees, consultants and members and their representatives are required to report any possible breaches of the Policy. Generally, all actual or potential breaches should immediately be reported to T.I.C.’s legal counsel. The contact information is as follows: Jones Day, Att. Luc Houben, 4 Rue de la Régence, 1000 Brussels, Belgium; lhouben@jonesday.com; phone: +32 2 645 14 11; http://www.jonesday.com/brussels/.

**For further information** regarding the basic concepts of antitrust law, including cartel agreements, and types of anti-competitive agreements such as price-fixing, market sharing, quantity-fixing and information exchange, please visit the T.I.C. website at http://www.tanb.org/view/antitrust-compliance-policy.
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Contact: ian.margerison@metalysis.com
+44 (0) 1709 872111
Presidents of the Association

1974  Cornelius Herkströter, Thaisarco
1975  Herman Becker-Fluegel, National Resources Trading / Tanco
1976  Paul Leynen, Zairetain
1977  Reinhard Deil, GfE
1978  Joseph Abeles, Kawecki Berylco Industries
1979  Brian Reynolds, Thaisarco
1980  George Korinek, Hermann C. Starck Inc.
1981  Conrad Brown, Fansteel
1982  John Linden, Greenbushes Tin
1983  Robert Franklin, STC Components
1984  Carroll Killen, Sprague Electric Company
1985  Chikara Hayashi, Vacuum Metallurgical Company
1986  Rod Tolley, Datuk Keramat Smelting
1987  Hans-Jürgen Heinrich, GfE
1988  Harry Stuart, Niobium Products Company
1989  George Korinek, NRC
1990  Peter Adams, Thaisarco
1991  Yoichiro Takekuro, Vacuum Metallurgical Company
1992  Peter Maden, Vishay Sprague
1993  Hubert Hutton, Sogem-Afrimet
1994  Peter Kähler, H.C. Starck GmbH
1995  Robert Barron, Cabot Performance Materials, David Maguire, KEMET
1996  Yeap Soon Sit, S.A. Minerals
1997  William Millman, AVX
1998  John Linden, Sons of Gwalia
1999  Charles Culbertson II, KEMET Electronics
2000  Thomas Odle, Cabot Performance Materials
2001  Axel Hoppe, H.C. Starck GmbH
2002  Josef Gerblinger, Epcos
2003  David Reynolds, KEMET Electronics
2004  William Millman, AVX
2005  William Millman, AVX
2006  Axel Hoppe, H.C. Starck GmbH
2007  William Young, Cabot
2008  José Isildo de Vargas, CBMM
2009  Richard Burt, GraviTa Inc.
2010  Richard Burt, GraviTa Inc.
2011  José Isildo de Vargas, CBMM
2012  Daniel Persico, KEMET Electronics
2013  Daniel Persico, KEMET Electronics
2014  David Henderson, Rittenhouse International Resources
2015  David Henderson, Rittenhouse International Resources
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Speakers’ Biographies

Biographies are of the lead author of presentations (alphabetical by surname, not in running order).

Mark Alexander, Plantronics Inc.
A downstream customer’s reliance on conflict free tantalum.

Mark Alexander is Staff Engineer for Environmental Compliance at Plantronics, a producer of enterprise and consumer communication headsets and related equipment. He has a physics degree from Case Western Reserve University, US Naval Nuclear Power School. His career to date has included the US Navy, Exxon Enterprises, 3M Company and Applied Materials. At Plantronics he has worked as an environmental engineer on Restriction of the Use of Certain Hazardous Substances (RoHS) implementation, REACH and Conflict Minerals compliance. Mark was named as one of the top Top-100 Conflict Minerals Influence Leaders 2016 and is a member of the American Chemical Society and ASM International.

Leah Butler, Conflict Free Sourcing Initiative (CFSI)
Conflict Free Smelter Programme tantalum industry briefing.

As Program Director of the CFSI, Leah Butler is responsible for oversight of the Conflict Free Smelter Program and operations of the CFSI. She works with CFSI members and external stakeholders to build consensus on CFSI policies and ensures adherence to quality standards that lead to continued market acceptance and program effectiveness. Leah has ten years of experience in regulatory compliance and extractive sector governance. She has worked for government, international development consulting firms, and the mining industry in the United States and Africa. Leah holds an MA in International Relations and a Masters of Environmental Management from Yale University.

Benjamin Clair, Better Sourcing Program
New due diligence models for conducting right-sized, cost efficient, and responsible sourcing of 3Ts and gold by Benjamin Clair (Better Sourcing Program) and William Millman (AVX Corp.) (presented by Benjamin Clair and William Millman).

Benjamin Clair graduated in Finance and Economics from Paris Dauphine University in France. He is the Managing Director of Better Sourcing Program (BSP) and has more than 10 years of experience in the natural resources sector, through roles in corporate banking, risk management, trading and deal origination. Benjamin is a recognised expert in the field of conflict minerals and supply chain due diligence. While traveling extensively to the central African Great Lakes Region, he has developed a specific understanding of the tantalum ore mining context and procurement opportunities in that part of the world.

Dennis Cooke, Panda Hill Tanzania Ltd
Panda Hill Tanzania Ltd - the progress to date and roadmap for the development of the world’s next new primary niobium mine.

Dennis Cooke qualified in 1985 as a metallurgist at the University of Johannesburg, South Africa. He joined Gencor and followed the company’s graduate training program, occupying technical, operational and managerial positions before being appointed as consulting metallurgist of Goldfields Limited. He has considerable operational, management and corporate experience including 11 years as General Manager of Metorex’s Vergenoeg Fluorspar Mine. Following this Dennis managed HSE, feasibility studies, projects and risk for Metorex’s mines across southern Africa. He was appointed in July 2015 as General Manager of Panda Hill niobium mine in Tanzania, with responsibility for its design, construction and operations.
Yuri Freeman, KEMET Electronics Corporation

*Effects of moisture on solid tantalum capacitors by Yuri Freeman and Phil Lessner, KEMET Electronics Corporation.*

Yuri Freeman received MS as engineer-physicist and Ph.D. in Solid State Physics from Kharkov Polytechnic Institute in Ukraine. He worked as Principal Scientist in the Russian capacitor industry and then at Vishay Sprague in Sanford, ME, and now at KEMET Electronics. Yuri's work is focused on science and technology of Tantalum and Niobium-based capacitors. He published more than 30 peer-reviewed papers and received 42 patents in this field. As Adjunct Professor of Material Science Yuri is also teaching at Clemson University, in Clemson, SC, United States.

Karen Hayes, Pact Inc.

*The iTSCi Programme after 5 years of operations, by Karen Hayes (Pact Inc.), Roland Chavasse (T.I.C.) and Kay Nimmo (ITRI), (presented by Karen Hayes and Roland Chavasse).*

Karen Hayes is Senior Director of the Mines to Markets Program of the Washington-based NGO, Pact. Her roles include that of senior field advisor for the implementation of the iTSCi Programme. Karen has a degree in science from Trinity College Dublin, Ireland, and an MBA from the University of Cambridge Business School (2001) in the United Kingdom. She has been working on governance and development issues in the mining sector in Africa for 15 years, with an emphasis on artisanal and small-scale mining. She has designed and delivered mining and development projects in over a dozen countries and currently oversees 15 projects operating in 10 countries covering such diverse issues as responsible mineral supply chains, promotion of women in mining, reduction of child labour, and reduction of conflict in mining.

David Henderson, Rittenhouse International Resources LLC

*Selected tantalum and niobium myths.*

David Henderson first got involved in tantalum and niobium in 1978, when Cabot Corporation bought what is now GAM Technology. Since then, he has held a variety of positions in the industry. He founded Rittenhouse International Resources, a specialty materials trading firm, in 2004. He has served on the T.I.C. Executive Committee since the 52nd General Assembly held in Almaty, Kazakhstan, in 2011. He has acted as President of the T.I.C. in 2014-2015 and 2015-2016.

David Knudson, Tantalum-Niobium International Study Center (T.I.C.)

*The T.I.C. statistics report 2016*

David Knudson is the Technical Officer to the T.I.C. He is a chemical engineer by training and has been in the tantalum industry for over 35 years. David started his career at Cabot Corporation's Boyertown plant in Pennsylvania, USA, as a research and development technician working on tantalum powder development projects. Subsequently he was promoted to Project Engineer and after 2 years, promoted to Manufacturing Engineer responsible for flaked powders and dry processing of all powders. David spent 23 years at Cabot before joining Niotan Inc in Nevada, USA, in 2003, rising to become Vice President of Engineering. After KEMET bought Niotan in 2011 and renamed it KEMET Blue Powder he held the position of Engineering Manager. David has been with the T.I.C. since July 2016.
Kazuhiro Koike, NEC TOKIN Corporation

Development of polymer tantalum capacitors with high reliability and high rated voltage.

Kazuhiro Koike graduated from Tohoku University, Japan, with a Masters in Applied Physics degree in 2006. After graduation from university he started working at the Capacitor Division of the product engineering department at NEC TOKIN Corporation in 2006. His responsibilities as a Capacitor Development Engineer began with aluminium capacitor development and currently he is focused on tantalum capacitor development.

Ian Mellor, Metalysis Ltd

The Metalysis process - a new era for alloy design and discovery by Ian Mellor, Greg Doughty and Ian Margerison, Metalysis Ltd.

Ian Mellor has a background in chemistry and materials, obtaining both his bachelor's degree and PhD from Nottingham Trent University in the United Kingdom. He has over 18 years’ experience of conducting applied research and product development, with 12 of these being in a managerial capacity. Ian joined Metalysis in 2004 assuming numerous positions from Research Scientist, Operations Manager to Technology Manager, and since 2014 Director of Technology where he is responsible for executing Metalysis technical programmes. Ian's work is extensively published, he is named on a number of patents and has authored numerous journal articles, conference papers and book chapters.

Cristina Mota Caetano, KEMET Electronics Corporation

New market segments and product technical achievements with polymer tantalum surface mount capacitors by Cristina Mota Caetano, Ana Tomás, Randy Hahn and Denis Lacombe, KEMET Electronics Corporation.

Cristina Mota Caetano graduated with a licentiate degree in materials science from the Technical University of Lisbon, Portugal, in 1996. After starting her career at Ziegler-Natta catalysts she became involved with tantalum capacitors at EPCOS (formerly Siemens Matsushita Components) in Heidenheim, Germany, in 1997. In 1998 she moved to Évora, Portugal, to work on process optimisation management and in 2003 was appointed Head of Development Department of Tantalum Electrolytic Capacitors, covering MnO2 technology. In 2005 KEMET acquired EPCOS. In 2008 she moved from R&D to a technical marketing function focusing on the strategy to develop KEMET’s European military and space markets and since 2012 she has had overall responsibility of tantalum technical product marketing.

Sophia Pickles, Global Witness

Tantalum supply chains today: how responsible are they?

Sophia Pickles leads Global Witness’s work on responsible mineral supply chains focused on eastern Democratic Republic of Congo (DRC) and the wider Great Lakes region of central Africa. Over the past decade Global Witness has investigated control by armed groups and individuals over the minerals trade in eastern DRC and has worked with civil society, governments and industry in the Great Lakes region and globally to develop supply chain due diligence standards to support responsible purchasing decisions by companies. She undertakes regular research in the Great Lakes region, including fieldwork in mining areas. She has worked in and on DRC since 2005. Sophia is a member of the Advisory Panel of the iTSci Programme.
Michael Tamlin, Neometals Ltd

Tantalite supply from the lithium industry.

Michael Tamlin is Chief Operating Officer of Neometals Ltd, a lithium and titanium resources company. Michael’s previous experience includes over 20 years in the lithium industry and more than 10 years in the tantalum industry while he was responsible for the commercial management of production from the Greenbushes and Wodgina Mines. He is also currently a director of Frontier Lithium, a lithium development in Ontario, Canada. Former positions include GM China for Galaxy Resources, VP Commercial for Enirgi Group Corporation and GM Marketing for Windimurra Vanadium. He has a degree in metallurgy and has worked in the above commercial and management positions as well as in Operations and R&D. He is a former T.I.C. Executive Committee member.

Alexey Tsorayev, NAC Kazatomprom / Ulba Metallurgical Plant JSC

Tantalum applications in numismatics and jewelry (presented by Kseniya Solomina).

Alexey Tsorayev has been the Director for Tantalum Operations and a member of the Executive Board at Ulba Metallurgical Plant JSC since 2009. Alexey has worked in the tantalum industry since 1986. Alexey was born on July 14th, 1964 and graduated from the North Caucasus Mining and Metallurgical Institute in 1986 where he studied nonferrous metallurgy. He also studied at Moscow’s Institute of Economics, Statistics and Informatics in 2007 where he was certified as a Recession-Proof Manager. He has held a range of senior and managerial positions at Ulba Metallurgical Plant JSC and has been a member of T.I.C. Executive Committee since the 54th General Assembly, held in York, United Kingdom, in 2013.

Zhao Hong-yun, CNMC Ningxia Orient Group

Study of large size large grain superconductor niobium disks by Zhao Hong-yun, Chen Ming-lun, You Yu-song and Huang Jun-feng (presented by Chen Wu).

Hongyun Zhao graduated with a degree in metallic materials and engineering from Northeast University, China, and joined Ningxia OTIC in 1996. Until 2010 he worked at Ningxia Orient Tantalum Industry Co., Ltd in the wire plant, research and development centre, and metal work plant where his responsibilities included quality control for tantalum and niobium metalwork. Since 2010 he has been the director of the superconductor division, Ningxia Orient Superconductor Technology Co., Ltd, where his responsibilities have included construction of the facility, research and development, manufacturing, and quality control for production of superconductors.

Interested in giving a presentation?

If you would like to make a presentation at the T.I.C.’s 58th General Assembly in Canada in October 2017, then please contact or send an abstract to info@tanb.org by March 31st 2017.

We look forward to hearing from you.
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<td>Mining, Processing, Engineering</td>
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<td><a href="http://www.angeloamerican.com.br">www.angeloamerican.com.br</a></td>
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<td>Nb Secondary Processing</td>
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Email: stevenmunnoch@avonmetals.com
Website: www.avonspecialtymetals.com
Activity: Recycling

AVX Corporation
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Website: www.avx.com
Activity: Capacitor Manufacture

B.W. Minerals Pty Ltd
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Website: www.hhezhong.com
Activity: Trading

Better Sourcing Program
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Website: www.bsp-assurance.com
Activity: Due diligence programme

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Website: www.buss-spezialmetalle.de
Activity: Recycling

CBMM
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Activity: Processing

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Activity: Mining
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Activity: Processing

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Activity: Potential Miner

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Website: www.ctns723.com
Activity: Potential Miner

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Website: www.cronimet.com
Activity: Mineral trading

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Website: www.dblockmetals.com
Activity: Recycling

DM Chemi-Met Ltd
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Email: daisy@dmchemimet.co.uk
Website: n/a
Activity: Trading

Duoluoshan Sapphire Rare Metal Co. Ltd of Zhaoqing
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Website: www.zqdls.com
Activity: Smelting

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Activity: Alloys, Processing, Recycling

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Activity: Raw Material Supply, Processor, Recycling

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Website: www.fxelectro.com
Activity: Processing

FIR Metals & Resource Ltd
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Activity: Processing

Global Advanced Metals Pty Ltd
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Activity: Mining, Processing

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Activity: Secondary Processing

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Website: www.hi-tempmetals.com  
Activity: Recycling

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ICD Alloys & Metals  
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Email: ian@icdalloys.com  
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Activity: Processing

Imerys Ceramics France  
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Activity: Nb Mining, Ta Mining

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<td><a href="http://www.kemet.com">www.kemet.com</a></td>
<td>Capacitor Manufacture, Processing</td>
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<td><a href="mailto:metalink@metalink.com.cn">metalink@metalink.com.cn</a></td>
<td><a href="http://www.metalink.com.cn/en">www.metalink.com.cn/en</a></td>
<td>Recycling, Trading</td>
</tr>
</tbody>
</table>
Metallurgical Products India Pvt. Ltd
Address: T-27, MIDC Industrial Area – Taloja, District Raigad, Maharashtra 410208, India
Email: vkumar@mpil.co.in
Website: www.mpil.co.in
Activity: Processing

Metalysis Ltd
Address: Unit 2, Farfield Park, Manvers Way, Wath Upon Dearne, Rotherham S63 5DB, United Kingdom
Email: ian.margerison@metalysis.com
Website: www.metalysis.com
Activity: Ta Secondary Processing

Metherma KG
Address: Arnheimerstrasse 109, 40489 Düsseldorf, Germany
Email: molybdenum@metherma.de
Website: www.metherma.de
Activity: Recycling, Trading

Mineração Taboca SA
Address: Vila Pitinga s/n, Zona Rural, Presidente Figueiredo, 69735-000, AM, Brasil
Email: lpagnoncelli@mtaboca.com.br and ronaldo.lasm@mtaboca.com.br
Website: www.mtaboca.com.br
Activity: Mining, Processing

Minerals Resources International AG
Address: Zugerstrasse 74, 6340 Baar, ZG, Switzerland
Email: sales@mrinternational.ch
Website: www.mrinternational.ch
Activity: Mining, Trading

Mitsui Mining & Smelting Co. Ltd
Address: Gate City Ohsaki West Tower, 19th floor, 1-11-1 Osaki, Shinagawa-ku, Tokyo, 141-8584, Japan
Email: d_nakayama@mitsui-kinzoku.co.jp
Website: www.mitsui-kinzoku.co.jp/en
Activity: Processing

MTU Aero Engines GmbH
Address: Dachauerstrasse 665, 80995 München, Germany
Email: maximilian.pfaus@mtu.de
Website: www.mtu.de/en
Activity: Aerospace Alloys, User

NAC Kazatomprom
Address: D. Kunayev st. 10, 010000 Astana, Republic of Kazakhstan
Email: tnurtazayev@kazatomprom.kz
Website: www.kazatomprom.kz/en
Activity: Processing
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Email</th>
<th>Website</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nanoscale Powders LLC</td>
<td>60 South Street, Suite 1120, Boston MA 02111, United States</td>
<td><a href="mailto:andrew.matheson@nanoscalepowders.com">andrew.matheson@nanoscalepowders.com</a></td>
<td><a href="http://www.nanoscalepowders.com">www.nanoscalepowders.com</a></td>
<td>Secondary Processing</td>
</tr>
<tr>
<td>NEC Tokin</td>
<td>560 Nyuzen, Nyuzen-machi, Shminiikawa-gun, Toyama 939-0626, Japan</td>
<td><a href="mailto:s-arai-sx@nec-tokin.com">s-arai-sx@nec-tokin.com</a></td>
<td><a href="http://www.nec-tokin.com">www.nec-tokin.com</a></td>
<td>Capacitor Manufacture</td>
</tr>
<tr>
<td>New Material Corporation</td>
<td>3F, No 3 Yoshida Bldg, 3-13-4, Akasaka, Minato-ku, Tokyo 107-0052, Japan</td>
<td><a href="mailto:k.higa@newmaterial.jp">k.higa@newmaterial.jp</a></td>
<td><a href="http://www.newmaterial.jp">www.newmaterial.jp</a></td>
<td>Trading</td>
</tr>
<tr>
<td>NPM Silmet AS (formerly Molycorp Silmet)</td>
<td>Keskstr 2, 40231 Sillamäe, Estonia</td>
<td><a href="mailto:d.obrock@neomaterials.com">d.obrock@neomaterials.com</a></td>
<td><a href="http://www.neomaterials.com">www.neomaterials.com</a></td>
<td>Processing</td>
</tr>
<tr>
<td>Plansee SE</td>
<td>Metallwerk-Plansee-Str. 71, 6600 Reutte, Austria</td>
<td><a href="mailto:eduard.kotz@plansee.com">eduard.kotz@plansee.com</a></td>
<td><a href="http://www.plansee.com">www.plansee.com</a></td>
<td>Secondary Processing</td>
</tr>
<tr>
<td>Refractory Metals Mining Co. Ltd</td>
<td>1008A Shing Chuen Industrial Building, 25 Shing Wan Road, Tai Wai, Shatin, Hong Kong, China</td>
<td><a href="mailto:info@rmmc.com.hk">info@rmmc.com.hk</a></td>
<td>n/a</td>
<td>Mine development</td>
</tr>
<tr>
<td>Resind Indústria e Comércio Ltda</td>
<td>Rodovia 265 Km 264, Distrito Industrial São João del Rei, MG 36315-000, Caixa Postal 157, Brazil</td>
<td><a href="mailto:almirclemente@resind.com.br">almirclemente@resind.com.br</a></td>
<td><a href="http://www.resind.com.br">www.resind.com.br</a></td>
<td>Secondary Processing</td>
</tr>
<tr>
<td>Rittenhouse International Resources LLC</td>
<td>P.O. Box 3714, Concord, NH 03302, United States</td>
<td><a href="mailto:dhenderson@rittenhouseir.com">dhenderson@rittenhouseir.com</a></td>
<td>n/a</td>
<td>Trading</td>
</tr>
</tbody>
</table>
For more than 30 years, Alex Stewart International Corporation (ASIC) has provided inspection and analytical services for base, minor and precious metals, including jewellery, ores and concentrates, ferro alloys, recycled scrap metal and also agricultural commodities.

Today, the network of regional Alex Stewart companies spans over 40 countries and delivers fast, flexible and comprehensive inspection, analytical and laboratory services to the metals and minerals industry, with coverage at all major ports and refineries. By maintaining a dedicated, friendly and trustworthy business relationship with clients, ASIC provides unparalleled technical support.

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Alex Stewart International Corporation bases its activities on the principles of responsibility, impartiality, professionalism and confidentiality.
Roskill Information Services Ltd
Address: 54 Russell Road, London SW19 1QL, United Kingdom
Email: patrick@roskill.com
Website: www.roskill.com
Activity: Research and Consultancy

Scandmetal International SA
Address: Rue Louis Hymans 45, 1050 Brussels, Belgium
Email: metals@scandmetal.com
Website: www.scandmetal.com
Activity: Trading

Shalina Resources Ltd
Address: 30th Floor, Almas Tower, Jumeirah Lake Towers, P.O. Box 340575, Dubai, United Arab Emirates
Email: uday.shetty@shalina.com
Website: www.shalinaresources.com
Activity: Mining

Solar Applied Materials Technology Corporation
Address: No. 1, Gongye 3rd Rd., Annan District, Tainan City 70955, Taiwan
Email: harryliao@solartech.com.tw
Website: www.solartech.com.tw
Activity: Secondary Processing

Solikamsk Magnesium Works
Address: St Pravda 9, 618500 Solikamsk, Permskay Region, Russia
Email: sales@smw.ru
Website: www.smw.ru
Activity: Processing

Sovereign International Metals & Alloys Inc.
Address: 2550 Middle Road, Suite 503, Bettendorf, Iowa 52722, United States
Email: alloys@simametals.net
Website: www.simametals.net
Activity: Recycling, Trading

Specialty Metals Resources SA
Address: Rue Tenbosch 42A, 1050 Brussels, Belgium
Email: philippe.lavagna@smr.hk
Website: www.smr.hk
Activity: Trading

Standard Resources Corporation
Address: 1141 Marlkress Road, Cherry Hill, New Jersey 08003, United States
Email: AlbertHayoun@StandardResources.us
Website: www.standardresources.us
Activity: Marketing
Stapleford Trading Limited
Address: Wayside, Stapleford Road, Stapleford Abbots, Romford, Essex RM14 1EJ, United Kingdom
Email: jim@staplefordtrading.co.uk
Website: www.staplefordtrading.co.uk
Activity: Trading

Taike Technology (Suzhou) Co. Ltd
Address: No. 20 Chengyang Road, Suzhou Xiangcheng Economic Development Area, Suzhou, Jiangsu 215131, China
Email: annali@taike-sz.com
Website: www.taike-sz.com/index-eng/product.asp?classid=125
Activity: Ta Processing

Tantaline
Address: Nordborgvej 81, L3-V108, 6430 Nordborg, Denmark
Email: sales@tantaline.com
Website: www.tantaline.com
Activity: Ta Metal, User

Tantec GmbH
Address: Tantalstraße 1-3, 63571 Gelnhausen, Germany
Email: g.raab@tantec-group.com
Website: www.tantec-online.de
Activity: Design and manufacture of Ta components and equipment

Telex Metals LLC
Address: 105 Phyllis Drive, Croydon, PA 19021, United States
Email: info@telexmetals.com
Website: www.telexmetals.com
Activity: Recycling

Thailand Smelting & Refining Co. Ltd
Address: 80 Moo 8 Sakdidej Road, Tambon Vichit, Amphur Muang, Phuket 83000 Thailand
Email: sales@thaisarco.com
Website: www.thaisarco.com
Activity: Tin Smelting

Traxys
Address: Route d’Arlon 19-21, 8009 Strassen, Luxembourg
Email: frederic.delforge@traxys.com
Website: www.traxys.com
Activity: Trading

Treibacher Industrie AG
Address: Division Hard Metals and Energy Storage, Auer von Welsbachstr. 1, 9330 Treibach-Althofen, Austria
Email: ulf.stromberger@treibacher.com
Website: www.treibacher.com
Activity: Powders for Hardmetal and energy storage alloys for hydrogen
Interested in joining the T.I.C.?

See page 37 for details of how to apply for membership and page 38 for a list of some of the many benefits of membership.
ULBA METALLURGICAL PLANT JSC

Ulba is a leading producer of Ta, Nb, Be and their alloys with more than 65 years work experience.

We convert any Ta and Nb raw material and manufacture both Ta and Nb Products in the following form:

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- Mill Products;
- Articles.

You are always welcome to contact us!

102 Abay Avenue
070005, Ust-Kamenogorsk
Republic of Kazakhstan
tel/fax: +7 (7232) 29 83 16
e-mail: Marketing_Ta@ulba.kz

Please visit our website www.ulba.kz for more details.
Applying for T.I.C. membership

Who can apply?
The T.I.C. membership is composed of companies from the entire niobium and tantalum supply chains, from explorers to miners, traders and processors, through to end users and suppliers of goods and services to the industry.

Corporate Membership or Associate Membership?
The majority of members are commercially involved in the tantalum and/or niobium industries and therefore have a corporate membership.

Associate membership is reserved for non-commercial organisations such as governments, civil society groups and academia.

The Executive Committee has the final decision concerning which category is applicable to applicant organisations.

How to apply?
Applications for membership are considered at the General Assembly each October and should be submitted at least one month beforehand.

To apply an organisation needs to:

- Complete the application form available online at www.tanb.org/terms-and-conditions or from info@tanb.org.
- Provide a brief description of its activities in tantalum and/or niobium.
- Confirm that they have read and understood the T.I.C.'s current policies**.
- Corporate applicants must gain the support of two existing member companies. The sponsors will be asked to confirm their support so it is highly recommended that applicants ask them first.
- Once the Executive Committee accepts the application an invoice is raised for the first year's membership fee (currently EUR 2400 for corporate members and EUR 350 for associate members). Full payment is required at least one week before the General Assembly.
- Valid applications for membership are subject to discussion and a vote by the existing members at the General Assembly via an anonymous vote by ballot paper. Applicants may not be present at the meeting during membership discussions and voting.
- Successful applicants are considered to be a member of the T.I.C. for the year during which they were accepted.

Regardless of the voting outcome, applicants are free to attend the technical conference that follows the members’ General Assembly.

If you are interested in joining the T.I.C. please contact info@tanb.org.

** In September 2016 these are the ASM Policy and the Transport Policy, but an antitrust policy and an ASM code of conduct will be considered at the 57th General Assembly in October 2016.
Benefits of T.I.C. Membership

The T.I.C. undertakes a wide range of activities in support of its members’ interests. The list of benefits for corporate members* includes but is not limited to:

**Information services for members**
- The Bulletin, our printed newsletter packed with technical papers and news.
- Quarterly niobium and tantalum statistics.
- Digital archives of tantalum and niobium technical papers and statistical reports on the members’ area of www.TaNb.org.

**Technical services**
- Priority advice and support from the T.I.C. Technical Officer, David Knudson.
- Guidance policies published on pertinent subjects, such as artisanal and small-scale mining and transport.
- Liaising with governments and other stakeholder organisations on subjects relevant to our industry including:
  - Supply chain due diligence and conflict-mineral legislation.
  - Transport of Naturally Occurring Radioactive Materials (NORM).
  - Critical raw materials regulations.

**The annual General Assembly (our technical conference)**
- Priority booking and exclusive discounts to attend the world’s leading tantalum and niobium technical conference.
- Exclusive networking opportunities at the annual members’ general meeting held each October.

**Benefit from T.I.C.’s promotion of niobium and tantalum**
- Exhibiting and presenting at conferences relevant to the industry.
- Commissioning research and reports about the global tantalum and niobium industries and fighting myths concerning these elements.

**Members decide the T.I.C. policies and strategy**
- All members can share in the T.I.C.’s governance at the General Assembly.
- Corporate members can nominate representatives to stand for election to the Executive Committee and/or volunteer to serve on a sub-team.
- Being listed as a T.I.C. member online and in the Annual Review demonstrates to the world your commitment to the tantalum and niobium industries.

**For details of how to apply for membership please see page 37.**

* For further information, including benefits of associate membership, please contact the T.I.C.
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PURE AND ALLOY

Tantalum    Niobium    Molybdenum
Tungsten    Hafnium    Zirconium
Chromium    Nickel     Cobalt
Vanadium    Indium     Other Exotics

All processing and quality assurance in house

PRODUCER OF
HIGH PURITY CHROMIUM POWDER
Purity 99.8% to 99.98% • Size -3 to -325 mesh
and
SYNTHETIC TANTALUM CONCENTRATES

SPECIALIZING IN
HIGH PURITY SPUTTER TARGET ALLOYS
RECYCLING UNIQUE TANTALUM REFINERY

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