TANTALUM-NIOBIUM INTERNATIONAL STUDY CENTER

PRESIDENT'S LETTER

Dear Members and Friends,

As we move into the Fall and Spring seasons (hemisphere dependent) we look forward to more moderate weather in the more extreme areas. I always look forward to this change of seasons. It also means that our General Assembly is right around the corner. It is my hope that your plans have been finalized and all that is left is to pack your bags (for those who are not constantly living out of the suitcase anyway).

As of late there have been some articles in the press regarding the impact of the Dodd-Frank legislation as well as the efficacy of the iTSCi provenance verification program; unfortunately, some of this press has been rather negative. I would like to make a few comments regarding both matters.

Dodd-Frank: is it good, is it bad? The fact is, we have it and must deal with it. The main concern regarding the unexpected consequences is the central theme supporting the negative press. Personally, I was in support of the legislation from the start and remain so today. With all the past press surrounding the atrocities in the Democratic Republic of Congo (DRC), the US Congress took a controversial but firm stance to finally put in place a level of accountability that was previously lacking. And it is far reaching. However, the legislation itself is not the issue. The issue is with those individuals and corporations who would shy away from the opportunity to do the right and humane thing by staying engaged in the region. In many respects it is they who are to blame for the current state of affairs in the DRC. Don't get me wrong, many are doing the right thing including T.I.C. member companies; however, unfortunate as it may be, highlighting good deeds does not sell newspapers! Other governing bodies are looking into similar legislation, taking into account the responses and reactions to Dodd-Frank. Perhaps they will come up with legislation that deals with some of the shortcomings of Dodd-Frank. I hope so. Nothing is perfect, but to do nothing was and is definitely not an option.

iTSCi: I begin this paragraph the way I ended the last: nothing is perfect but to do nothing was and is not an option. Those who have been and those who are currently on the ground in the DRC and surrounding countries understand the complexities of implementing the iTSCi program. And those of us who are realists understood that waiting for perfection meant nothing would ever happen. Certainly the iTSCi program has its shortcomings; but just as with Dodd-Frank we need to look on improving what we have rather than throwing it all out and starting from scratch. As I see it, breadth and depth are the main issues. Speed of broader implementation, ongoing monitoring and the timeliness of data availability are among the issues the naysayers are bringing up. All are resource related issues. Just ask those who are on the ground day-in and day-out expending personal capital and sweat equity. There is much to learn from the iTSCi program and model. If the iTSCi model is struggling due to resource limitations, perhaps it is time for additional provenance verification models to come forth; not to replace iTSCi, but to broaden the scope and speed of implementation. There are many sites looking to be included in such programs, many tantalum sites.

The ultimate goal is to put more people back to work in sustainable and humane environments where they can feed their families and bring more tantalum ore to the market. It is easy to point a finger, it is another thing to expend personal capital and sweat equity and do something about it. The T.I.C. has played a significant role in this area in the past and we continue to support full transparency in the conflict minerals supply chain. It is our responsibility to remain engaged and play a significant role in the next phase of this discussion. We will not shy away from our responsibilities.

The Dodd-Frank and ore provenance verification issues will be well represented in the many presentations at the Fifty-fifth General Assembly in New York City. I look forward to seeing all of you in New York City so we can continue this discussion.

Regards,

Dr Daniel F. Persico (Dan) President

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FIFTY-FIFTH GENERAL ASSEMBLY

The Fifty-fifth General Assembly will be held in New York, U.S.A., from October 12th to 15th 2014. The conference will take place at the Sheraton New York Times Square Hotel.

On Sunday October 12th, the registration desk will be open from 10a.m. to 1p.m. and 2p.m. to 5p.m. All participants are invited to a Welcome Reception that evening, from 6p.m. to 8p.m.

The formal General Assembly of the association will be held from 8.30a.m. till 9.30a.m. on Monday October 13th, this session is for existing members only. It will be followed by technical presentations until mid-afternoon, with a break for a buffet lunch.

On Monday evening, all participants are invited to a Gala Dinner to be held in the Metropolitan Ballroom of the hotel.

A second technical session will be held on Tuesday October 14th, breaking for a buffet lunch and ending mid-afternoon.

The full technical programme is published herebelow.

On the morning of Wednesday October 15th, delegates will be given the opportunity to visit the facility of Hi-Temp Specialty Metals, located about two hours away from New York in Yaphank, on Long Island. After the tour of the company, the busses will travel part of the way back along Long Island before stopping for lunch in the Great South Bay area.



The Sheraton New York Times Square Hotel

Tours for accompanying persons are also being arranged for Monday and Tuesday. The first day will take participants to Kykuit, a splendid estate which was the home to four generations of the Rockfeller family. This six-storey stone house and its elegant terraced gardens will reveal collections of sculptures, tapestries, automobiles and horse-drawn carriages. After lunch, the group will discover the Union Church of Pocantico Hills and its stained glass windows by Matisse and Chagall, also commissioned by the Rockfeller family. The second day, the group will discover New York City: the 'Top of the Rock' viewing platform on the 65th floor of the Rockfeller Center, a behind-the-scenes tour of the Lincoln Center for the performing arts (Metropolitan Opera, New York State Theater, Juilliard School...), the 9/11 Memorial, the financial district then a guided tour of the Museum of Modern Arts (MoMA) featuring an introduction to the building and the highlights of the collection. Transport will be by coach.

TECHNICAL PROGRAMME - ABSTRACTS

The following papers are expected. The announced presenter is the first author listed, unless otherwise specified. The papers are shown in the expected running order.

The genesis of tantalum and niobium - an African journey

by Ramez Nasser and John Galani, Universal Mining Group (both presenting)

The presentation will focus around two themes:

- a discussion of our world class pegmatite hosted deposit, with a geological explanation of how tantalum and niobium occur within it and how the occurrence can be analysed from a geological perspective, including its significance and plans for future exploration in West Africa as well as processing techniques and the need to understand your customers in mining planning;
- a discussion of the pitfalls and logistical challenges of doing business in remote locations in Africa where dealing with the unexpected is a way of life! Anecdotal stories to highlight that planning back in the head office and delivery on the ground are vastly different challenges, the continuous requirement to operate in a socially responsible way, dealing with theft, both at equipment and mineral level, with the resulting need for traceability. On a more macro-economic level, the need to engage with local authorities and the growing resource activism of African governments is changing the mining industry with increased stability becoming the key element in an investment decision in mining.

Mineração Taboca: a reliable and long term supplier of tantalum and niobium units to the industry

by Itamar Resende, Mineração Taboca

A general overview will be presented of Mineração Taboca's activities in Brazil. This paper will cover the present and future prospects of this company, and its challenges and opportunities. It will include a briefing on the geology, mine reserves for Ta and Nb oxides, past and present production capacity. In addition it will review its current technology development and its impact on the production of tantalum and niobium oxide units for the industry.

Reconciling trade associations with antitrust

by Luc Houben and Yvan Desmedt, Jones Day (both presenting)

The T.I.C. decided to schedule a session on antitrust enforcement and compliance given its increasing relevance around the world.

Over the last decade, legislators and enforcement authorities have placed antitrust laws as a top priority. It is considered an essential requirement to ensure a competitive market.

More than a hundred jurisdictions have antitrust laws now and enforcement activism is following. Some investigations have had wide-ranging repercussions, as it established cartels, illegal distribution practices, or monopolistic behaviours. Market players have been subject to heavy fines and sometimes even criminal sanctions for the leading management of the company. Whistleblowing programs have also created incentives for companies to denounce potential cartels which significantly increased potential risks.

The T.I.C. is well aware of these risks and is adhering to a strict compliance policy in order to ensure that all members can fully participate in its activities. Promoting the industry's collective interest through a trade association is necessary and antitrust laws recognize the benefits it can bring to the market. The session at the 2014 General Assembly will shed more light on how to reconcile a trade association's mission with antitrust laws, illustrating where there is a common ground and where the boundaries lie.

Delivering a conflict-free supply chain: Intel's journey

by Carolyn Duran, Intel Corporation

This project started with a straightforward but seemingly impossible goal of delivering conflict-free supply chains. We chose to do this for one simple reason: it was the right thing to do. Egregious human rights atrocities have been committed for decades in the DRC, and partial funding of these comes from the illicit trade in conflict minerals - including tantalum - which are used in our products. This talk will focus on the Intel perspective of how we started with tantalum, working outside of traditional electronics industry expertise, and partnered with metal industries, smelters, non-governmental organizations (NGOs), and governments to develop the systems and processes that are now the standard for all conflict minerals. But that is only one piece of the puzzle - we also had to determine where conflict minerals are used in our complex supply chain. We fully mapped our supply chain to the source of origin. We do not directly buy these raw metals - we buy targets, precursors, solders, flux, wires, memory... Often there are 6+ tiers to the source. The team worked up/down the supply line to determine, with high confidence, relevant smelters. Initially, the supply line had little information on smelter sources, but over 4 years, this team was able to break through multiple layers in the supply chain (suppliers, traders, banks...), address confidentiality concerns, and identify smelters. We personally visited smelters, some more than once, to introduce the issue, share the validation process, and convince them to 'voluntarily' participate in sourcing validation. Most smelters and suppliers reside outside of the U.S. Most were unfamiliar with the issue in the DRC and did not believe that their product had anything to do with the conflict. We had to first convince them of the issue's importance and their role in it, and second that they should open their doors to engage in the validation process. Through this partnered effort we have been able to convince all tantalum smelters in our own supply chain to go through CFSI audits and support responsible sourcing from the region.

Conflict minerals post-filing - now what? Industry response and regulatory landscape

by Ron Oleynik and Paolo Mastrangelo, Holland & Knight, LLP (both presenting)

The Securities & Exchange Commission's new 'conflict mineral' regulations impact thousands of companies and manufactures, be they public or private, domestic or foreign, small or large. With the first filing deadline behind us, considerable media and stakeholder attention has now turned to how companies have implemented compliance programs, and to what extent industries can glean 'best practices' and 'lessons learned'. The presentation focuses on the current legal, regulatory, and political environment in the U.S. and abroad, including: auto-legislation sentiments and how they have shaped compliance, and how the rule has or has not encouraged consumers, companies and governments to develop sustainable solutions for

mineral use in order to reduce violent conflict and curb human rights abuses associated with black-market mineral trade. Particular attention is paid to the variation in company practices and interest in merging conflict minerals due diligence with their overall business and corporate responsibility practices. We also discuss the reputational risk and stakeholder pressure that companies are facing in the wake of the first reporting period, as well as the potential benefits successful companies and industries face. We find that companies that approach compliance from a serious, cross-functional perspective are better able to incorporate flexibility into their compliance programs in order to manage the risk of a changing global regulatory landscape and of increased industry and consumer demands.

Critical materials supply chains: a public policy perspective

by Jeffery Green, J.A. Green & Company

As members of this Assembly are well aware, governments in the United States and the European Union have taken steps to implement new reporting requirements on tantalum, tungsten, tin and gold, collectively referred to as 'conflict minerals'. Notwithstanding the significant public scrutiny that these minerals have drawn, this attention is a subset of an expanding trend by national governments to investigate and implement risk mitigation strategies for perceived weaknesses in the supply of 'critical materials' to their respective industrial bases.

In the United States, one of the most significant drivers of this trend is national defense. In every defense acquisition program, the Department of Defense (DoD) is required to purchase 'specialty metals' from domestic sources or other qualifying countries. This law has received significant attention of late, due to the inclusion of Chinese parts in the F-35, F-16 and B-1B aircrafts. In addition, the DoD has established multiple agencies to investigate critical material supply chains, and these investigations continue to serve as the basis for source selection / exclusion decisions, stockpile / disposition plans, and subsidized production of materials. Tantalum and tungsten are two of the key materials monitored by the DoD.

This paper will discuss the key U.S. laws and overlapping authorities that govern the designation and management of 'critical materials', as well as provide a primer on the key questions and concerns of DoD policymakers and other interested organizations in Washington, DC.

There's no statistics like show statistics

by Ulric Schwela, Tantalum-Niobium International Study Center

To paraphrase the famous song title may unduly raise expectations of an exciting statistics show. Sadly the turning of statistics into a thrilling Broadway show is beyond the skills of this presentation's speaker, and it would probably be inappropriately distracting anyway. Instead, the title is an oblique way of saying that with no statistics, we have no show!

The complete and timely collection of industry statistics for niobium and tantalum has always been and continues to be a primary concern of the T.I.C. While statistics are collected via an independent intermediary to reassure reporting companies that their commercial confidentiality is preserved, other seemingly unavoidable obstacles will prevent one company or another from reporting in a timely manner and so hold up the entire reporting process. These issues continue to be tackled head on by the T.I.C.

Additionally, a new statistics sub-committee has been formed from members of the Executive Committee, to better analyse, discuss and resolve the issues that have been affecting the completeness and timeliness of the industry's statistics.

The T.I.C. statistics are issued to the members every quarter, with two main categories for niobium and four main categories for tantalum:

- Niobium primary production
- Niobium processor shipments
- Tantalum primary production
- Tantalum processor receipts
- Tantalum processor shipments
- Tantalum capacitor producer receipts

Each of these is further sub-divided into two to six sub-categories.

The presentation will look at the figures for the last decade to reveal past trends, as well as highlight differences between various categories.

Elk Creek, Nebraska: niobium – strengthening our world

by Mark Smith, NioCorp Developments Ltd

NioCorp is developing a high grade, large tonnage niobium project in Elk Creek, Nebraska. The resource is the third richest deposit known in the world and the only one known in the United States.

The goal of the company is to be part of the solution for the world's strategic and critical niobium needs for the steel, automotive and aviation industry. Niobium is crucial in high strength steel for bridges and buildings, high pressure oil and gas pipelines, lightweight and fuel efficient cars, MRI machines, wind turbines, airplane jet thrusters, and more.

Elk Creek is an advanced development project with over 53,000 meters of drilling that has produced several NI 43-101 resource reports, the latest one in 2012 (see <u>www.NioCorp.com</u>). The geological formation compares favourably to the three existing producers in the world, two of which are located in Brazil and one in Canada.

Niobium prices have increased significantly in the past decade but are now very stable. In 2013 niobium averaged approximately \$40-45 per kilogram. Demand is expected to further increase in the coming decade as new applications are discovered and as the intensity of use of niobium in steel production continues to grow.

NioCorp has initiated metallurgical optimization studies at Hazen Research and SGS Labs. In addition, it is conducting infill drilling to elevate its resource from the indicated and inferred category to the measured and indicated category (refer to NI 43-101 for a definition of these terms). NioCorp also plans to simultaneously work with SRK Engineering on completing a bankable feasibility study, with the goal of completing this effort by late 2014 or early 2015. By October 2014, significant news from these technical studies will be available and NioCorp plans to discuss the results at the T.I.C. conference in New York.

Development and marketing of polymer tantalum capacitors

by Takashi Kono, NEC TOKIN Corporation

NEC TOKIN was the first company in the world to apply an intrinsically conductive polymer (conductive polymer) as the counter electrode for tantalum capacitors. Conductive polymers first started being used in the manufacture of tantalum capacitors in the 1990s. As of late, a myriad of suppliers are using conductive polymers in the manufacture of their tantalum capacitors.

Further developments in the field of tantalum capacitors have been and are currently being made by developing new methods for applying the conductive polymer.

Polymer tantalum capacitors have many unique properties. In this presentation, we explain the properties of conductive polymer tantalum capacitors and the development of tantalum capacitors.

The electrical and electronic equipment we use in our daily lives is rapidly changing, and the application method of capacitors is also changing. Polymer tantalum capacitors are mainly used to stabilize the power supply line of mobile phones, tablet PCs... We will report on the many applications for polymer tantalum capacitor in electrical and electronic equipment and consider future potential applications.

New method for producing high CV/g tantalum powder

by James Fife, KEMET Blue Powder Corp.

In past decades the manufacture of flake shaped tantalum particles has been limited to relatively low CV/g categories of powders on the order of 20,000 CV/g. This has been caused by a combination of inappropriate conditions used in the milling process whereby nodular tantalum particles are deformed into flattened shape by impacts with milling media. The inability to achieve high specific surface area in tantalum flake has driven investigators to explore ever higher milling energies to overcome this limitation; resulting in tantalum powder with only marginally increased specific surface area, and that is highly contaminated with the materials of construction of the mechanical mills used for the processing.

Now KEMET Blue Powder in Carson City Nevada has broken the old CV/g barrier while maintaining the chemical purity of the powder. CV/g levels in the new flake powders easily exceed 30,000 CV/g with excellent powder flow, crush strength and lead wire attachment. The new milling technology developed to achieve this breakthrough is very different from previous attempts; and the tantalum flakes produced are materially very different from tantalum particles made before by any method.

How high CV can go in tantalum capacitors

by Yuri Freeman and Philip Lessner, KEMET Electronics

Thin native oxide always covers the surface of tantalum powder when it is exposed to oxygen or air. During the heating stage of powder sintering, oxygen from native oxide dissolves in the bulk on the powder particles. When coarse tantalum powder is sintered in a vacuum at temperatures above 1880°C, oxygen evaporates from the tantalum, leaving the bulk of the powder particles practically free of oxygen. When medium and high CV/g tantalum powders are sintered in vacuum below 1880°C, oxygen remains in the tantalum during the sintering, forming a solid solution of oxygen in tantalum. During the cooling after the sintering, the solubility limit of oxygen in this solid solution reduces sharply. This can cause oversaturation with oxygen and precipitation of the new phase - crystalline Ta₂O₅, which negatively affects electrical and mechanical properties of the tantalum anodes and oxide dielectric formed on the surface of these anodes. The size and density of the crystalline Ta₂O₅ inclusions are proportional to the ratio between the surface and volume of the primary particles or inversely proportional to the ratio between the surface and volume of the primary particles or inversely proportional to the ratio between the surface and volume of the primary particles or inversely proportional to the radius of these particles. The paper presents experimental data on how this mechanism limits application of the high CV/g tantalum powder with submicron primary particles as well as possible solutions to overcome this limitation and continue the race to the most volumetrically efficient tantalum capacitors.

Conflict-Free Sourcing Initiative: where are we and where are we going?

by Michael Rohwer, Conflict-Free Sourcing Initiative (CFSI) / Electronic Industry Citizenship Coalition (EICC)

The Conflict-Free Sourcing Initiative (CFSI) has experienced tremendous growth both in activity and in membership over the last year. However, the CFSI still has more work to do to help companies source tantalum responsibly. This presentation will cover the progress to date in developing a conflict-free tantalum supply chain. Next, it will summarize our current status and challenges. Then, the presentation will turn to suggesting a future state for the Conflict-Free Smelter Program (CFSP) that takes a more holistic approach to validating companies' efforts to avoid contributing to conflict through their mineral sourcing practices via the OECD's Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (OECD Guidance). This holistic approach is intended to more closely match validation against the expectations laid out in the OECD Guidance specifically for upstream companies. Importantly, we will also address how we approach helping companies' source responsibly from central Africa and other conflict-affected and high-risk areas to address the emerging EU regulatory framework.

Unearthing new procurement opportunities for conflict-free tantalum

by Benjamin Clair, Better Sourcing Program

The Better Sourcing Program (BSP) is an independent, integrated solution for cost effective and third party audited due diligence assurance, which allows compliance of the upstream part of the mineral supply chain with the Conflict-Free Smelter Program (CFSP) audit protocol. The BSP approach to supply chain validation is supported¹ by the Conflict-Free Sourcing Initiative (CFSI), which operates the CFSP.

BSP is designed to implement a transparent process to demonstrate conflict-free and responsible sourcing from artisanal, small scale, and semi-mechanised mining operations. It provides a consistent flow of information in direct alignment with requirements from the OECD Due Diligence Guidance, including:

- 1. Strong management systems
- 2. Risk assessment and mitigation
- 3. Traceability system
- 4. Local monitoring and consultation
- 5. Third party audit
- 6. Public reporting including enhanced communication to manufacturers and end-users.

The Program is also conceived to address current stakeholders' concerns about existing traceability schemes, *i.e.* (i) overreliance on local government agents, (ii) non-standardised approach to organisation-level management systems, (iii) insufficient local consultation, (iv) issues with the reliability of traceability data at the point of export, (v) hoarding of information, and (vi) excessive costs.

BSP is a flexible and commercially driven approach to certification which accounts for the specific circumstances of each supply chain. The Program works with a range of partners to develop new tantalite procurement opportunities worldwide, with an early focus on Level 3 countries as per the Conflict-Free Smelter Program (CFSP) Audit Protocol.

A Better Sourcing tantalum supply chain is currently being set up in Congo Brazzaville and the Program partners have received early support from the governments of Uganda, Zambia and D.R. Congo to implement Better Sourcing systems across those countries.

We wish to take the opportunity of the T.I.C. General Assembly to present updates on the Program, as well as our vision for working with the tantalum industry, by providing world recognised and commercially sensitive supply chain certification.

¹ <u>http://www.conflictfreesourcing.org/resources-and-training/complimentary-programs/</u>

Getting to conflict-free: next steps in weeding out conflict minerals from supply chains

by Sasha Lezhnev, Enough Project

Significant progress has been made over the past five years with regard to conflict minerals in the DR Congo, but there are still significant obstacles to overcome. More and more smelters are getting audited, yet gold and some of the 3Ts, although to a lesser extent than previously, continue to fund armed groups in Congo through smuggling. The presentation will focus on three topics:

- 1) What has been achieved to date, with a particular focus on in-region efforts in Congo and the Great Lakes region.
- 2) What is needed now to close loopholes in traceability, auditing, and certification systems.
- 3) What industry actors and governments must do to push forward reforms on ending monopoly systems, advancing minerals certification and responsible investment, and combating smuggling.

How is Rwanda implementing 'conflict minerals' legislations and what are the perspectives on tantalum and niobium? by Evode Imena, Ministry of Natural Resources, Rwanda

Rwanda sits on the Kibaran belt rocks, a system covering a part of the African Great Rift Valley. This belt is well known to be rich in minerals especially tin, tungsten, tantalum, niobium, gold, lithium, nickel, beryl and others. In Rwanda the key minerals being mined are ores processed to extract tin, tungsten and tantalum; the latter accounted for more than 50% of minerals exports value in 2013.

The Government has embarked in a drive to modernize and boost the industry which is currently dominated by small scale operations. Good quality geology data are acquired and made available to private investors and the legal and regulatory frameworks are continuously improved to meet investors' expectations. Recent discoveries have shown large areas highly prospective in niobium and tantalum in the central, southern and western parts of the country.

For the last ten years, the sector has grown on average 10% per annum and the growth potential is enormous. In order to be achieved, there is a need for strong investment, better mining techniques and minerals treatment methods and value addition. However, matters related to 'conflict minerals' are hampering the sector's development. Nonetheless, the Rwandan Government and all private operators in the industry are engaged in addressing these matters.

The country has set up a system encouraging responsible sourcing of minerals and ensuring transparency and traceability of minerals along the supply chain. Regional and international standards such as the ICGLR Regional Certification Mechanism, OECD guidance and EICC recommendations are used as reference and incorporated in national regulations. Challenges still remain and there is still room for improvement, but the solution requires engagement of all players from the mine to the end-user.

MEMBER COMPANY NEWS

CHANGES IN MEMBER CONTACT DETAILS

<u>Erame</u>t

The delegate for Eramet has changed and is now Mrs Marie-Christine Jaulmes. She can be contacted on <u>marie-christine.jaulmes@erametgroup.com</u>

KEMET Electronics

The e-mail address of Dr Daniel Persico has changed. He can be contacted on danielpersico-rc@nec-tokin.com

NEC Tokin Corporation

The delegate for NEC Tokin has changed and is now Mr Masayuki Yamane. He can be contacted on <u>m-yamane-yk@nec-tokin.com</u>

Tosoh SMD, Inc.

The delegate for Tosoh SMD has changed and is now Mr Mike Dixon. He can be contacted on <u>michael.dixon@tosoh.com</u>

EXECUTIVE COMMITTEE

According to the Charter of the T.I.C., the Executive Committee may consist of between two and eleven people, plus the President. 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 composition was approved by the T.I.C. members at the General Assembly on Monday October 14th 2013, and it currently consists of (in alphabetical order):

- John Crawley
- Alan Ewart
- David Gussack _
- Dale Gwinnutt
- _ David Henderson
- Jiang Bin -
- lan Margerison
- William Millman -
- _ Yasukazu Muto
- -
- _ Itamar Resende
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