

Newsletter from October 11<sup>th</sup>, 2007

## 1. RoHS: One year later!

- *The industry perception prior to July 2006 was a virtual overnight switch to lead-free!*
- *Stringent rules haven't been implemented and enforced, yet!*

by Zulki Khan, President, NexLogic Technologies Inc. The industry's conversion from leaded (eutectic) to lead-free has been slow. The industry perception prior to July 2006 was a virtual overnight switch to lead-free. However, today many OEMs still have a "don't care, wait and see attitude" since they're either RoHS-exempt at this time or don't sell into Europe.

Others are at the decision-making stage. They're wondering how far they can stretch leaded products before yielding to extra lead-free dollar outlays. Most major chipmakers and component manufacturers have complied with RoHS, although in some cases proper labeling is still missing.

Nexlogic Technologies, a mid-size EMS provider, can be used as an example to point up this RoHS compliance sluggishness. Our target was to transform 50 percent of our projects to lead-free this year. At the start of RoHS compliance, we had five to 10 percent of our projects lead-free. Subsequently, that number rose to 40 percent, but the 50 percent mark has not been reached as of this writing.

Slow industry response can be partly attributed to the European Union (EU) and associated agencies. They have not been strict about enforcing RoHS compliance. This is not to say the EU isn't being diligent and companies aren't complying. Rather, stringent rules haven't been implemented and enforced, yet. It appears the EU has intentionally taken this approach to allow OEMs, EMS providers, and CMs more breathing room.

### Industry Coming Together

EMS providers and OEMs continue facing and resolving lead-free design, fabrication, and assembly issues. These problems are bringing companies closer together to discuss and resolve them.

Take for example the tin whisker problem, which is not new, but is aggravated in lead-free applications. Tin whiskers are electrically conductive crystalline structures of tin. Sometimes they grow from surfaces using tin as a final finish. Lead-free alloys are composed of tin, silver, and copper. The lack of adequate lead content and greater amount of tin in this alloy triggers tin whisker growth. Tin whiskers can grow to lengths of several millimeters up to 10mm. Electronic system failures are often attributed to short circuits caused by tin whiskers that bridge closely-spaced circuit elements.

One solution is tin-plating the copper in lead-free products at 150°C for 24 hours to reduce the potential of creating tin whiskers. Solutions like this are emerging from consortiums and forums dedicated to discussing and resolving lead-free issues. But achieving solutions is slow due to the complex nature of these issues.

PCB surface finishes and the correct solder paste represent another problematic area. Lead-free assembly requires finishes such as electro-less nickel immersion gold (ENIG), immersion silver, organic solderability protectants (OSP) and lead free hot air solder leveling (HASL).

Lead Free surface finishes are critical because their conductivity is considerably higher compared to the tin-lead variety used for eutectic PCBs. These finishes withstand higher reflow temperature cycles. There

is also less probability of the pads peeling away from the board surface when exposed multiple times to higher temperature cycles.

The issue deals with which one to use due to trade-offs and limitations. HASL has a shelf life of about 18 months; OSP has only six months. Immersion silver has a shelf life ranging from 12 to 16 months, while ENIG is the most durable at 24 months. OSP cannot undergo more than two or three reflow cycles. If more rework is required, then the SMT pads on the OSP finish begin peeling off. OSP, therefore is not the best finish when multiple rework cycles are involved. But immersion silver or gold can undergo six to eight reflow cycles. Also, they have a flatter surface finish, which is more conducive to a perfect assembly than a HASL finish, specially for fine pitch devices, BGAs and CSPs.

As for solder pastes, alloy selection has been a major consideration for assuring solder joint quality, reliability and production yields. Most EMS providers have chosen tin-silver-copper alloys (SAC) for leaded solder replacement. Two popular ones are SAC305 and SAC307 which are slightly different in alloy compositions. However, SAC305 or Sn96.5 Ag3.0 Cu0.5 with a melting range of 217°C to 220°C has been the alloy most EMS providers use due to a higher degree of solderability and flux wetting.

Other problematic areas being resolved are shrink holes and Black Pad. A shrink hole is an anomaly caused by a crack in a solder joint using SAC305 or 307 alloy. Costly rework is required when it occurs. Black Pad is a defect mostly occurring on ENIG surface finish boards. It is a solder joint separation formed on the surface of the electro-less nickel underplate. It is caused by excessive phosphorous in the electro-less nickel. Good thing is that it is an anomaly and not an everyday occurrence.

Hybrid PCBs populated with lead-free and eutectic components continue to sporadically pose issues. Aside from surface finish issues, RoHS compliance calls for special attention to PCB design so that assembly is flawlessly performed. This includes careful component selection and placement, choosing the correct solder pastes and also defining the assembly process to ensure that the hybrid assembly is performed smoothly. Depending on the number of lead free components, an EMS provider can define the whole assembly process as a leaded process whereby the lead free components are added at a later stage or vice versa.

### Logistics Issues

However, there are costly and time delay problems CMs and EMS providers face at the operational level. On the one hand, mis-labeling or non-labeling of lead-free components is perhaps the biggest and costliest problem. On the other hand, many new and different symbols signifying lead-free products have emerged worldwide since July 1, 2006. Mis-labeling or non-labeling leads to erroneously mixing lead-free with eutectic components and applying incorrect eutectic assembly procedures. An overabundance of worldwide symbols demands additional resources to sift through the maze of complicated, confusing, and ambiguous symbols and labels.

Lastly, China RoHS officially raised its head earlier this year. It appears to be more demanding than the EU's version. In effect, it's a current distraction from fully concentrating on the EU's RoHS compliance.

### Executive Summary

The European Commission has requested the European Regulators Group for Electricity and Gas (ERGEG) to prepare a report on ERGEG's experience with the Member States' compliance with the Regulation (EC) 1228/2003 (Regulation (EC) No 1228/2003 of the European Parliament and of the Council of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity, hereafter "Regulation"), in cooperation with the European Commission. ERGEG has assessed the compliance with the obligations under the Regulation in the areas of Inter Transmission System Operator

Compensation (ITC) mechanism, Transmission Tarification (TT), Congestion Management (CM) and within that scope transparency and new interconnectors.

The Regulation provides for binding guidelines on ITC mechanism, Transmission Tarification and Congestion Management. With the entry into force of the Regulation on the 1st of July 2004, the first Guidelines on Congestion Management (annexed to the Regulation) became legally binding and on the 1st of December 2006, the amended Congestion Management Guidelines took legal effect. The Regulation requires parallel adoption of ITC and Transmission Tarification Guidelines, but the difficulties with deciding on the appropriate ITC scheme have postponed the process. ITC Guidelines and Guidelines on Transmission Tarification have not been adopted so far. It is important for the development of the internal electricity market to have the guidelines on the two remaining issues adopted as soon as possible in order to have binding EU rules for the network access charges (Transmission Tarification Guidelines) and Inter-TSO Compensation (ITC Guidelines).

The ITC scheme has been run on a voluntary basis by the European Transmission Network Operators' (ETSO). The latest ETSO agreement on ITC mechanism was accomplished on 27<sup>th</sup> of May 2007 to cover the time period of June-December of 2007. The voluntary ETSO schemes applied have not fully complied with the Regulation, with the major sources of non-compliance being (i) the applied cost basis, i.e. not taking into account the Long Run Average Incremental Costs (LRAIC), and (ii) the fees that have been set for nominated export to the non-participating countries and for nominated import from the non-participating countries within the EU, in so far these fees have not been socialized among the transmission network customers.

ERGEG has prepared in 2005 draft Guidelines on Transmission Tarification. As tariff structures may vary across the countries and also within a country, the approach applied in the draft TT Guidelines has been to propose the harmonisation of G charges at transmission network level and to introduce a specific range for the G charge with dedicated categories for continental Europe, Nordel, UK and Irish systems.

The G charges in the Member States already fulfil to a high extent the harmonisation requirement of the draft TT Guidelines by falling within the range set for the fees for generators.

However, the requirement of removal of international supply transaction based charges in the draft TT Guidelines is not presently fulfilled because of the fees for non-participating EU countries set in the voluntary ETSO ITC scheme.

The Regulation provides the general principles for managing congestion, while the Congestion Management Guidelines lay down more detailed rules including transparency requirements. In general the allocation procedures at the different borders are applied for all the available transmission capacity as required by the CM Guidelines. However, long term capacity reservations exist at the Swiss borders, at the Poland – Slovakia border and Slovakian side at the Slovakia – Hungary border.

According to the CM Guidelines, the congestion management methods shall be market-based. Explicit and implicit auctions are considered for that purpose. Furthermore, for intra-day trade continuous trading may be used. Explicit auctions are used at most of the European borders for long-term allocation of capacity and these are also used for short-term day-ahead allocation in continental Europe. Implicit auctions with market splitting or market coupling are used (or will be used) for short-term allocations (day-ahead and/or intraday) at interconnections between Nordic countries, in continental Europe between France, Belgium and the Netherlands and linking Nordic market with the continental Europe.

The CM Guidelines require that capacity allocation is coordinated and implemented using common allocation procedures among those TSOs having mutual affect on their grids. In this respect the regions defined in the CM Guidelines do not fully comply with the Guidelines.

Only a few TSOs publish all relevant information related to network availability, access and use together with a report on congestions and its future management. Publication of data is not yet coordinated within regions. TSOs have published general information on the auction mechanism but detailed information of these mechanisms is rarely published. The same applies for capacity calculation: only general or partial descriptions of capacity calculations have been published. Only a few TSOs publish annually the evolution of transmission infrastructure for the longer term while some TSOs publish this information bi-annually or less regularly. All TSOs publish at least available capacity for daily auctions and allocated capacity but publication of monthly, weekly and intra-day capacity forecasts varies depending on the market design. Only some TSOs publish ex-ante information on planned outages and ex-post unplanned outages of generation units larger than 100 MW.

ERGEG will continue to monitor the compliance with the CM Guidelines and prepare a second compliance report in year 2008. Furthermore, ERGEG will continue the work on the CM Guidelines to provide recommendations on interpretations and, where necessary, recommendations on amendments to the CM Guidelines. The recommendations will be a subject of a separate document and will be delivered to the EC as an ERGEG advice during the year 2008.

According to Article 7 of the Regulation, new direct current interconnectors or significant increases of capacity of the existing interconnectors may, upon request, be exempted from certain provisions of the Regulation. So far only one exemption has been granted on that basis, to a direct current interconnector connecting Estonia with Finland in February 2005.

Source: [ecnasiamag.com](http://ecnasiamag.com)

## 2. Irish beat WEEE recycling targets!

- *Irish householders are smashing targets for recycling waste electrical and electronic equipment!*
- *There was still room for improvement and more smaller items needed to be recycled!*

More than 7kgs of household WEEE per person was collected for recycling in 2006 - almost double the 4kgs target the WEEE Directive requires Ireland to achieve by the end of 2008.

However, environment minister John Gormley said there was still room for improvement and more smaller items needed to be recycled.

The figures were announced just before the start of Ireland's National Recycling Week, which began on Monday.

Mr Gormley said: "I am very pleased with these figures. The amount of WEEE material that has been recycled by Irish householders is a national success story.

"The figures offer great encouragement in advance of National Recycling Week, when we will be urged to consider if there is anything further we can do to better manage our waste."

The WEEE recycling scheme was launched in August 2005 requiring all Irish local authorities to pick up household WEEE from collection points free of charge.

But more than 80% of the waste collected in 2006 by weight consisted of fridges, freezers, large household appliances and televisions.

Mr Gormley said: "It is clear that not enough small items of WEEE are being recycled.

"All WEEE is hazardous and none of it, no matter how small, should be placed in the household bin."

He challenged producers to invest in an awareness programme to educate the public about recycling schemes for electronic equipment and said they must provide adequate facilities to collect and transport items for recycling.

The government is now working on a protocol to encourage more reuse of electronic equipment, which is set to be completed by the end of the year.

**Source: edie.net**

### **3. EU: Commission to help small and medium-sized companies become greener!**

- *European Union's 23 million SMEs as a whole represent about 99% of all EU enterprises!*
- *Funding for the Programme's measures will come from LIFE+ funds (€5 million for 2007-13)!*

Helping small and medium-sized companies use energy and resources efficiently is the aim of a recently published Commission Communication. It does this by providing a legal framework and measures that reinforce existing policies and initiatives in line with the particular characteristics of smaller companies. To this end the Communication proposes to create a programme to help small and medium-sized companies implement European environmental legislation. The programme will channel financial resources towards support networks, simplify access to environmental management systems, and promote greater awareness of environmental issues among these companies.

European Commissioner for the Environment Stavros Dimas said: "To successfully tackle the environmental challenges we face and to achieve our targets on greenhouse emissions, renewable energy and energy efficiency, all European companies must be on board. Small and medium-sized companies are an integral part of Europe's economy and it is therefore vital that they play their part in making the European economy more sustainable."

#### Small and medium-sized companies and the environment

Individual small and medium-sized enterprises (SMEs) employ less than 250 people, but the European Union's 23 million SMEs as a whole represent about 99% of all EU enterprises and 57% of the Union's total economic added value. Being responsible for such a large percentage of the EU economy's turnover the impact of SMEs on the environment is significant.

Many companies are not aware of the impact their activities have on the environment and a majority actually think that their activities have little or no impact. SMEs also tend to believe that they are complying with legislation unless told otherwise. Under such circumstances the activities of SMEs may pose significant health and safety risks to workers as well as a threat to the environment.

And by not integrating environmental considerations into their economic activities SMEs could lose also out on the economic benefits presented by better environmental management and eco-innovation.

### Environmental Compliance Assistance Programme

The Environmental Compliance Assistance Programme proposed by the Commission is a set of measures that aim to help SMEs minimise the environmental impact of their activities and to facilitate compliance with existing legislation. The Programme intends to reduce the burden of compliance by designing instruments and policies to integrate environmental concerns into the core of SME activities.

The measures presented in the Communication also cover the dissemination of information specifically targeted for SMEs, promoting support networks, and training activities that build local environmental expertise.

Funding for the Programme's measures will come from LIFE+ funds (€5 million for 2007-13) with additional funds to be made available through the Competitiveness and Innovation framework Programme (CIP) and the Structural Funds.

Several measures are already planned for 2007. A website providing information on EU environmental policy for SMEs is now available in seven languages and guides on energy efficiency, air emissions, soil and water and waste are planned. A handbook on funding opportunities will also be published.

The new network replacing the Euro Info Centre Network in support of business and innovation will participate in implementing the Programme from 2008. This and other SME support networks will play an important role in helping SMEs translate European environmental policies into operational measures.

### Promoting good practices

The Staff Working Document attached to the Communication presents a selection of case studies and examples of good practice from SMEs across Europe and the world. The document is available on the Commission website.

More information  
SME and environment website:

<http://www.ec.europa.eu/environment/sme>  
Good practice case studies:

[http://ec.europa.eu/environment/sme/cases/case\\_study\\_en.htm](http://ec.europa.eu/environment/sme/cases/case_study_en.htm)

**Source: europa.eu**