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Verification Issues and Clarifications Report

I. BACKGROUND

EPEAT staff has received several questions from subscribers who are in the process of registering products to the IEEE 1680 standard. Some of these issues require clarification as to how the Product Verification Committee will interpret the standard in making verification decisions.

These clarifications could affect whether and how subscribers declare products to specific criteria. Therefore the process to resolve the inquiries is as follows.

1. Staff drafted this report explaining the issues and providing recommendations.
2. The PVC considered this at their meeting on January 5, rendering a judgment on each issue.
3. Staff has redrafted the report accordingly.
4. PVC reviewed and approved the revised report by January 15.
5. Staff will post the report on www.epeat.net and notify subscribers and other interested parties.
6. After a 30-day period during which subscribers may alter product registration accordingly, Verification Round One will begin.[1]

Authority of the PVC: Most of the issues raised have been handled by simple clarifications that are made well within the wording of the standard. The resolution of some issues may suggest a needed revision of the standard, or an interpretation outside the wording of the standard.

Staff asked the EPEAT Board of Advisors (BofA) for advice in a meeting on 10/10/06 on how the PVC should address such issues. The general sense of the BofA was that the PVC should interpret strictly according to the wording in the standard. Staff concurs that for the PVC to go beyond the wording of the standard, even when logic and reason suggest such, establishes a dangerous precedent.

It is EPEAT's role to implement the standard by confirming conformance with it as it reads. It is the PVC's role to make decisions regarding verification to the standard and to clarify for subscribers through this document how the PVC will pass judgment on particular cases that are subject to misunderstanding.

The BofA further advised that there are options for how to deal with standard issues that cannot be resolved by a clarification of the PVC's intent in verification. For an illustrative example see the memo to the BofA attached at the end of this draft. The following is quoted from the meeting minutes:

- For those problems identified BEFORE a verification round, the PVC could chose not to conduct verification on the problem criterion, and push for changes to the standard to resolve the issue.

[1] Note that once the verification process begins, marked by the issuance of the Round One Verification Plan by the PVC, a snapshot of the product declarations subject to verification will be taken. That is, the verification and all consequences of that will be based on the product declarations at that time.

- For problems identified DURING a verification round, the PVC could choose not to act on recommendations of nonconformance tied specifically to the problem criterion – i.e. PVC could rule that products are still in conformance with the standard even if products are found not to meet the letter of the standard in particular criteria.

  HOWEVER, if it is clear that one or several subscribers were capable of both meeting the letter and spirit of the criteria, then there would be less justification for the PVC to take this step

Role of IEEE: Of course IEEE is the owner of the standard and holds the sole authority to change the standard. In reality, the effective IEEE body is the 1680 Working Group, which included primarily EPEAT Development Team members and could be reconvened at any time by coordinating with IEEE personnel.

The Working Group – effectively a group that would be reconvened by the Working Group chair, Holly Elwood – has basically two options: 1) to issue an "Interpretation" simply by meeting and deciding on it. An Interpretation cannot change the wording or intent of the standard. Or 2) alternatively the Working Group could decide on a change to the standard, which would need to be balloted. The later would be a several month activity and could stimulate further proposals to change the standard.

Types of Issues Being Raised: There seem to be three classes of issues that require different types of responses:

1. Those that simply require clarification, because the wording seems to be clear in the standard and our procedures are adequate to handle it.

   Response: We have handled these with simple e-mail replies.

2. Those that raise issues which are not clear in the standard, relate to the scope or requirements of the standard, and should be clarified or resolved at the standard level.

   Response: These should be submitted to the IEEE 1680 Working Group, or a subgroup of the Working Group, through IEEE processes, for a formal standard interpretation or amendment.

3. Those that raise issues that would effect how a product verification may be decided. These will require judgment calls by the Product Verification Committee, but do not seem to involve uncertainties in the standard that would require a formal IEEE standard interpretation.

   Response: These are submitted to the PVC for a decision through the issuance of a Clarification Report.

The difference between types 2 and 3 may be a judgment call in some cases.

EPEAT staff has handled several questions that came in and needed rapid response. When the subscriber needed a judgment to proceed with a declaration, as a courtesy, EPEAT staff provided their understanding of the criterion with the caveat that the PVC will have the final authority. EPEAT staff provided their recommendations to the PVC as summarized in the "background analysis" section for each clarification issue below. This document records the PVC determination, which supersedes any prior communication on the issue with EPEAT staff.

II. CLARIFICATION ISSUES FOR THE PVC (Type 3 Issues)

Following are the outstanding issues that were reviewed by the PVC.

1. Regarding 4.1.4.1 – Optional criterion: Elimination of intentionally added lead

Question came from one subscriber:

> 1680 requires lead levels less than 50ppm. The verification requirements require either empirical data from supplier demonstrating compliance or analytical test data. The subscriber specifies that their suppliers not intentionally add lead. They also require their suppliers to provide test data at the level of 100ppm. The subscriber states that it is likely that other subscribers do not require test data at all, and that 50ppm is very low given testing capabilities. Is this sufficient?

Background Analysis: 1680 actually includes two different implicit standards for this criterion: 1) no intentionally added lead (in the criterion title and apparently the intent of the criterion) and 2) lead below 50ppm (the requirement in the criterion itself). This has implications for verification.

In addition the verification requirement in 1680 reads: "Evidence of certification from component manufacturers that is based on either empirical data demonstrating compliance or analytical test data demonstrating compliance." Thus verification does not necessarily require testing to a specified level, but it does require either empirical or analytical data that demonstrates conformance to that level. The question is what "empirical data" is satisfactory. The "certification from component manufacturer" would seem to be an attestation by the component manufacturer that they have not added lead to the product and that none of their suppliers have added lead through any process. The certification can be backed up by empirical data that includes assurance of conformance through a quality control program.

This could be further supported, though not required, by evidence that the manufacturer has placed such requirement on their suppliers, that is, that they have specified no lead.

The specific subscriber that asked the question states that their documentation requires no added lead of suppliers. They would also need to provide evidence from the supplier that no lead was added, and then that would appear to meet the intent of the criterion for empirical data demonstrating conformance. However, in the requirements of their suppliers they specify testing at a less stringent level (100 ppm versus 50 ppm) than 1680 requires at 50ppm. Does the specification of a higher testing level imply that the product may not, in all cases, meet the criterion, even though "no added lead" is also specified? Since the standard wording cites specifically 50ppm, does this imply that there should be a test at that level?

The standard is not internally contradictory; it simply includes two different requirements for demonstration of conformance, separated by an "or". Meeting either of those requirements would suffice for demonstration of conformance based on manufacturer-supplied verification data. Of course, nothing would prevent the PVC from having analytical tests performed to confirm the representation of the manufacturer.

PVC Determination: The wording of the criterion prevails over the title of the criterion wherever there is a conflict or inconsistency. In this case, the criterion defines the threshold to which the determination of no added lead must be measured – "50ppm by weight per listed part".

- Certification by suppliers of no intentional added lead and manufacturer specifications are not sufficient to satisfy the Verification Requirements.
- The Verification Requirements are very clear that certifications are based on either empirical or analytic test data demonstrating compliance. See the Guidelines on Subscriber Verification Data for the submittal of quality control procedures to satisfy these data requirements.

- Demonstration that parts do not exceed the 50 ppm level is required according to the wording of the criterion.
- The term "listed part", which differs from the RoHS test of homogeneous material, refers to the types of parts listed as example in the criterion, or the VDU as a whole.

2. Regarding 4.3.1.1 – Required criterion: Identification of materials with special handling needs

The following question came from one subscriber:

> Would it be acceptable to the Green Council if we identified such materials in the users manual? We have checked several EPEAT products and we did not note any makings on the computer, but were indicated in the manual. I am referring to mercury in the backlight tube, which is exempted in the RoHS Directive specifically. The state of Vermont will require that notebook computers be labeled to identify the presence of mercury, by July 1, 2007. But we, and apparently other manufacturers are not yet ready to apply such a label as yet until close to that date. This is a very important point that remains to be resolved and would greatly appreciate your response

Background Analysis: The intent of the standard is to "provide treatment information to reuse and recycling facilities". It does not specify how to provide the information, and therefore any reasonable attempt that would make the information directly accessible to recyclers would be reasonable.

It has been documented that manuals are not generally provided along with electronic equipment for recycling. Moreover, a survey of recyclers indicates that not very many access information from manuals.

When this criterion was developed, the thought was that this type of information would be available on a web site of some sort – either the manufacturers or a common one. The Green Electronics Council has spoken with the National Center for Electronics Recycling and IAER about hosting such a site, and there is interest.

PVC Determination: Posting treatment information on the manufacturer's web site, possibly in an on-line manual, is acceptable. Likewise, labeling on the product would also make it directly accessible to recyclers. However, simply publishing the information in a hard copy manual that does not typically accompany a device at end-of-life is not an adequate demonstration of providing treatment information **to** recyclers.

3. Regarding 4.3.1.2 – Required criterion: Elimination of paints or coatings that are not compatible with recycling or reuse

The following question came from one subscriber:

> 1) ASTM D256 method does not specify the sampling preparation procedure. It is not clear whether we need to imitate the typical recycling process for the IZOD impact test including extrusion or whether we could run a test by making test samples by molding plastic pieces. 2) Recycled resin will have potentially impacted by 1) recycling process including heat exposure and 2) paint coating mixed into the resin. It is not clear whether we will need to run two series of test, one without paint (either obtaining the part without pain or scraping the paint) and one with paint and compare the IZOD impact results.

A second question about this criterion came from a potential future subscriber:

> As IEEE 1680, 4.3.1.2, says: All covered products shall not contain paints and coatings on larger plastic parts that are not compatible with recycling and reuse.

However, we've got some lab 3R reports analyzing that EMI shielding film (composed of metal) on plastic parts is so small quantity that could be neglected when recycling. Therefore, could it be acceptable for EPEAT?

A third similar question came from a subscriber:

Is it accepted in case the front bezel of the monitor has painting on it (silver color)? I have checked it with TUV and TUV said even if it has painting on it, it is recyclable.

Background Analysis: The standard requires that "compatible with recycling" refers only to the resulting physical/mechanical properties of the recycled resin and is defined in 3.2.2 by a specified ASTM lab test that compares the properties of a sample of the plastic with the coating relative to a sample of the same plastic without the coating. Clearly the samples of each must be prepared in a process that involves grinding, melting and molding in some manner, because that is how a recycled plastic material is produced. If the precise manner of doing so is not specified in the ASTM procedure, then the subscriber would have flexibility in how they would simulate the recycling process.

The verification requirements specify that the subscriber will provide the results of such a test, or the supplier verification of such, if paints/coatings are used.

The intent of the criterion is that large plastic parts (>100g) can be separated from the product and processed into a recycled plastic that retains characteristics that do not compromise its functionality. It uses the definition of "compatible with recycling" which is defined in 3.2.2 by the IZOD impact test.

In conducting the impact test, the following options have been defined:

Option 1 (preferred): Compare IZOD impact of two parts, following a recycling process simulation (i.e., grinding, pelletizing): 1) painted plastic part; 2) same part, but unpainted.

Option 2: Compare the IZOD impact of a painted plastic part, following a recycling process simulation, to the IZOD specification for the resin. The IZOD specification could be the manufacturer specification or supplier-provided material properties data.

PVC Determination: The 3.2.2 definition is compatible with either option above. The measure is if there has been >25% reduction in the IZOD test results in comparison with un-painted plastic, but it does not specify how the test level for un-painted plastic be defined.

The criterion should be applied to whole parts >100g in size as molded and pre-assembly, i.e. plastic housings. In other words, the manufacturer is not required to speculate as to how a recycler might disassemble the product, but rather should test the parts in the form they occur prior to assembly.

Note that neither the lab 3R reports nor the TUV assertion cited above are either a "manufacturer test" (unless, of course, 3R or TUV supported their assertion by the applicable test) or a "supplier verification", so they would not meet the verification requirements.

4. Regarding 4.3.1.8 – Required criterion: Minimum 65% reusable/recyclable
Regarding 4.3.1.9 – Optional criterion: Minimum 90% reusable/recyclable

Several companies have asked for clarification.

- How will we confirm conformance?
- How many recycling tiers are considered? In other words, if a 3rd tier recycler discards some material, should that not be counted as recycled?

Following is a quote from one subscriber:

Issue: Calculation method is not clearly defined. For example, if a component or part is sent for recycling by tier one vendor to tier two vendor, whether the entire component/part can be considered as recyclable, or whether we would need to exclude a part of component that will not be recycled by the tier two vendor is not clear.

Background Analysis: These are difficult criteria to be certain of conformance, since demonstrating the recyclability of an electronic product is new and uncertain ground. The standard states that the definition is "in accord with" the WEEE Directive. The WEEE Directive will therefore provide the context for the definition of "recyclability". However, the WEEE was adopted by the EU, and the enforcement, as well as many of the enforcement standards, is left to the member countries of Europe. Thus the EU has provided some but not all the principles necessary for EPEAT purposes.

Another important difference is that the WEEE Directive measures the recycling targets according to a stream of products. However, EPEAT relates to individual products. This makes it difficult to translate the WEEE targets into individual product design criteria.

Note that all quoted text below is from the WEEE Directive unless otherwise cited.

Article 7 of the WEEE Directive sets targets "regarding WEEE sent for treatment" for IT equipment:

- "Component, material and substance reuse and recycling shall be increased to a minimum of 65% by an average weight per appliance."
- Note that a "recovery" rate of 75% is also set. It includes energy recovery, such as combustion in a waste-to-energy plant, and thus is not applicable in the EPEAT definition of recyclable. Therefore this target is not relevant.

The WEEE also provides certain other principles that must be considered in claiming product recyclability rates:

- Definition of "treatment" – "any activity after the WEEE has been handed over to a facility for depollution, disassembly, shredding, recovery or preparation for disposal and any other operation carried out for the recovery and/or the disposal of the WEEE".
- WEEE treatment requires the removal of all fluids and selective treatment of Hg containing lamps, batteries, plastics with BFRs, CRTs, liquid crystal displays, and certain other components and materials. This does not imply that these materials cannot be counted toward recycling targets, if indeed they are recycled, but that they cannot be simply shredded with other components and materials.
- "Reuse of whole appliances…shall not be taken into account for the calculation of the targets." However, the reuse of components is counted toward the recycling/reuse targets.
- The EU has recognized that it is allowable "to use an estimate as to the average percentage of reused, recycled and recovered materials." [2005/369/EC: Commission Decision of 3 May 2005 laying down rules for monitoring compliance of Member States and establishing data formats for the purposes of the WEEE Directive.] This implies that the calculation of recyclability rates is not intended to be highly precise.

It is important to note that the required EPEAT criterion, based on the experience in Europe to date, is not difficult to achieve for the current stream of end-of-life electronics. "Existing

systems show a recycling rate of about 80-90% (including energy recovery). It is still very difficult to make comparisons of recycling and treatment performance due to varying standards and definitions between countries." [European Commission Technical Report Series, "Implementation of the WEEE Directive in the EU", 2006.] Note that the 80 – 90% cited above compares to the WEEE target of 75%, not to the reuse/recycling rate of 65%. In any case, we expect that achieving the EPEAT required criterion of 65% would likely not be difficult, but achieving the optional criterion of 90% reusable/recyclable would likely require demonstration of higher recyclability than average existing products.

The key question is then how to determine what portion of a product is recyclable. At each tier in the chain of recycling facilities that handle the product, certain "non-recyclable" portions are disposed of, or used for some purpose other than recycling such as energy recovery. In other words, the key question for the subscriber is to know what portion of their product would end up as rejected material, and to deduct that from the total weight of the product.

PVC Determination: The following principles should be used by subscribers in determining the percentage reusable/recyclable for EPEAT conformance:

- Calculations for EPEAT will utilize the WEEE principles identified above, noting that energy recovery, such as combustion in a waste-to-energy plant, is specifically excluded from the EPEAT definition of recyclable.
- The reusable/recyclable percentage will be the weight of materials that is recyclable, divided by the total weight of the product, multiplied by 100.
- The manufacturer has no control over how a product is disassembled or shredded at end-of-life. Therefore the manufacturer should consider the reusability or recyclability of the materials and components as they are assembled or in the assembled product.
- Materials that would be separated out for disposal or energy recovery at the point of collection, by the sorter (triage), or by a disassembler or shredder, will not be counted as reusable/recyclable.
- The "demonstrated recycling technology" would be applied in assessing the reusability/recyclability of those materials and components as assembled. It is expected, though not specifically required, that a subscriber has investigated real world recycling processes relative to the specific characteristics of the materials and components of registered products to ascertain what portions would, through demonstrated technologies, in reality could be reused or recycled.
- The number of tiers in the recycling chain, or the location of those operations, is not strictly relevant to this calculation.

5. Regarding 4.5.1.2 – Early adopter of a new ENERGY STAR standard: This criterion has come into effect due to the recently adopted ES 4.0. Subscribers can claim it now, but no one has. The issue is that the Verification Requirements read "Demonstration of ENERGY STAR certification". But the criterion is intended to be used before the new ES requirement does into effect. So there will not be any "certification" by the ES program.

Background Analysis: During the development of this criterion at the last minute, the discussion was along the lines that we would expect to be delivered to us for verification the same kind of test data that would be delivered to ES for the manufacturer to be certified to ES.

PVC Determination: The term "ES certification" was intended to mean the subscriber's evidence (certification) that the product meets ES 4.0, and that evidence would be the applicable test data that would be required for ENERGY STAR compliance.

6. Regarding 4.6.1.2 – Optional corporate annual report criterion: Auditing of recycling vendors.

Subscribers have asked: What is the geographic scope of this criterion? Are only the recycling vendors in North America (or the US) required to be audited annually to the 3rd tier, or does the criterion have worldwide application? If worldwide, does that mean all regions where first through third tier recyclers are located, or all regions where the product is sold? It has also been asked what type of auditing is required.

Background Analysis: This criterion was adopted late in the EPEAT development process and was discussed as being a partial "make-up" for not including restrictions on export of product to be recycled. Auditing of recycling vendors was discussed as partial protection against environmentally irresponsible recycling, including overseas where the major problems have been documented.

PVC Determination: The criterion is silent on specifying a regional restriction. It therefore applies worldwide, especially when considering the intent of the criterion to partially address environmentally unfriendly recycling resulting from export. Since the criterion applies to recycling vendors, rather than the product itself, it should apply wherever the recycling vendors (first through third tier) are located. Also, an EPEAT declaration applies to all units of the product sold anywhere, and the 4.6.1.1 criterion requires that a product take-back service be offered to institutional purchasers anywhere. It seems to follow that auditing should apply to recycling vendors anywhere who are downstream processors servicing product from the subscriber registered to this standard.

The subscriber should provide to the Qualified Verifier a map or guide to the first through third tier recyclers that participate in the subscriber's "take-back and recycling service" to support the verification process.

Note that some components may be removed from products during recycling and sold for reuse. If sold as tested working products or components, they leave the recycling stream and therefore do not require further auditing. The auditing requirement applies only to the take-back and recycling service. However, if materials are separated and sold for recycling, the audit requirements apply.

The criterion does not exclude internal audits; however, in all cases an on-site visit must be conducted by the subscriber or a third party to ascertain the adequacy and relevance of the audit to the requirements of this criterion.

If this criterion is selected for verification, additional guidance may be forthcoming to assist the subscriber.

7. Regarding 4.6.2.1 – Required corporate annual report criterion: Provision of rechargeable battery take-back service.

It has been asked whether a subscriber must be a licensee of RBRC to satisfy the participation in the RBRC program requirement in order to claim this criterion.

Background Analysis: The criterion does not require a subscriber to be a licensee of RBRC, but being a licensee would automatically meet the criterion. A couple of subscribers have claimed this criterion not as RBRC licensees. If not a licensee, conformance would be tested according to a yardstick of equivalence ("equivalent to or better than that provided by RBRC").

One complication to consider is that the RBRC program is available for all rechargeable batteries and applies to all purchasers of products. So, in one possible interpretation, a subscriber may be able to meet the criterion by being a 'free rider' on the RBRC system. That is, they would simply direct their customers to use RBRC to recycle rechargeable batteries from their products.

PVC Determination: The Verification Requirement b) requires that the subscriber provide "Documentation of battery take-back service". If the subscriber is a licensee of RBRC then demonstration of such is adequate to meet this verification requirement. Of course, they must also meet Verification Requirement c) to provide "Documentation of notification of user of battery take-back service".

If the subscriber is not a licensee of RBRC, then they must provide documentation that demonstrates that the service is provided at a "competitive price" and that it is "equivalent to or better than that provided by the RBRC". This guidance is intended to provide a yardstick by which it will measure "equivalence" based on wording in the 4.6.2.1 criterion.

As outlined in the Verification Requirements and References and Details, the following is required for "equivalent" programs:

- Demonstration that the take back service is equivalent in cost or less expensive for the user (i.e. purchasers of products) as RBRC and is equivalently convenient as RBRC for the user
- Documentation of notification of users of battery take-back service by making information available on the web site, in product literature, or other equivalent means
- Affixing of recycling system notification to rechargeable batteries used in the registered product
- Documentation of amounts returned.

Since the criterion is explicit about being an RBRC licensee, being a "free rider" does not demonstrate conformance with the criterion. If not an RBRC licensee, the subscriber must provide an equivalent service.

8. Regarding 4.7.3.2 – Optional corporate annual report criterion: Corporate report based on GRI

A company asked if the required index to the corporate report can be provided on the web.

PVC Determination: The index should be provided to purchasers and other stakeholders in whatever form the full report is provided. The criterion does state that the report and the index shall be provided with the verification data.

9. Regarding 4.8.2.1 – Required criterion: Separable packing materials.

A subscriber noted that the criterion specifies only that materials be "separable", and that they "shall be able to be segregated into like materials without the use of tools". However, the verification requirements specify that "dissimilar materials are not glued together". Some packaging practices use a "post it" type glue to keep items in place during packing but are easily separable.

PVC Determination: The wording of the criterion should take precedence over the more restrictive wording of the verification requirement. Even if "glue" is used, but the materials can "be segregated into like materials without the use of tools", then the product (packaging) is in conformance with the criterion.

10. Regarding 4.8.2.2 – Optional criterion: Packaging 90% recyclable and plastics labeled.

The following question came from one subscriber:

> Is there an exemption for marking very small plastic packaging parts (e.g. approximately the size of a quarter)? Currently many of our products have all the plastic packaging marked with the exception of some small parts like cable retainer clips and handle anchors (see attached photos). We would like to claim the optional point for the packaging recyclability and marking, but these small, difficult to mark parts are blocking us.

Background Analysis: The standard is clear. "All" means all. But marking systems generally (e.g. 1680 for product components and even laws relative to plastic bottles) have a lower limit. This is an instance where the wording in the standard is clearly unreasonable by not providing an exemption for small parts. In addition, the standard addresses two issues: 1) packaging is 90% recyclable and 2) plastics labeled.

PVC Determination: Per the advice given by the EPEAT Board of Advisors, the PVC shall, if this criterion is selected for verification, verify only the 90% recyclable portion of the criterion.

The PVC further recommends that this criterion be amended to establish a lower mass threshold for labeling and packaging in future revisions of the standard.