

EPEAT PRODUCT VERIFICATION PLAN

Note: The following will be a section of the EPEAT Operational Procedures Manual. This is the overall plan for the verification process, not a plan for a specific verification round.

“GEC” refers to EPEAT, Inc. staff

“PVC” stands for Product Verification Committee

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1. Establishment of the Verification System

This section first describes the steps to develop the verification system and then provides greater detail on elements of the system.

1.1. Steps toward Establishment of the Verification System

1.1.1. Development of plan for verification system (this doc)

1. GEC drafts plan for development of verification system, including:

- Steps in establishment of verification system
- Process for recruitment and appointment of PVC members
 - Qualifications of PVC members
- Process for recruitment and selection of Qualified Verifiers
 - Qualifications of Qualified Verifiers
- Training plan for PVC members and Qualified Verifiers

2. BofA reviews and comments on the verification system development plan and approves PVC and Qualified Verifiers qualifications

3. GEC finalizes the verification plan

1.1.2. Formation of PVC

4. GEC publishes recruitment notices, follows leads and accepts applications

5. GEC Director develops Agreement to be signed by PVC members, gets it approved by BofA, GEC lawyers, and EPEAT Board of Directors
 6. PVC applications due date
 7. Potential PVC members are interviewed by GEC
 8. GEC Director selects PVC members
 9. GEC Director engages PVC members under Agreement
 10. GEC delivers PVC training and orientation materials¹
 11. GEC conducts initial training and orientation conference call with PVC
 12. GEC/PVC conducts initial 2-day in-person meeting
- 1.1.3. Issuance of Standard Verification Issues and Clarifications Report
13. GEC prepares Standard Verification Issues and Clarifications Recommendations Document
 14. PVC considers and approves Standard Verification Issues and Clarifications at initial 2-day meeting
 15. GEC publishes the Standard Verification Issues and Clarifications Report.
 - One month will be provided before verification round begins
- 1.1.4. Development of Qualified Verifier Team
16. GEC publishes recruitment notices
 17. Qualified Verifier applications due date
 18. GEC develops Qualified Verifier Agreements
 19. GEC interviews Qualified Verifiers
 20. Director selects Qualified Verifiers
 21. GEC signs Agreements with Qualified Verifiers
 22. GEC develops verification protocol
 23. GEC prepares Qualified Verifier orientation and training materials and program
 24. GEC conducts orientation conference call with Qualified Verifiers
 25. GEC conducts 2-day Qualified Verifier training
- 1.1.5. Annual refresh
- Each year, or as needed, any of the preceding steps may be repeated. In particular, replacement of members or resolution of standard verification issues may be undertaken.
- 1.1.6. First round of verification begins

1.2. Establishment of the Product Verification Committee

Initially the PVC shall consist of 3 members. This number shall be reviewed following the initial verification round and possibly increased to five for further rounds if desirable. The initial Agreement with the PVC members will be only for one year and will provide flexibility for extension into additional years.

1.2.1. Qualifications of PVC members

¹ Note: GEC will coordinate and provide staff support for all PVC meetings, while not being a voting member.

PVC members shall possess the following qualifications.

Required qualifications:

- “Independent” as defined in the EPEAT Operational Policies²
- Expertise in the technical assessment and environmental characteristics of electronic products.
- An advanced degree and/or have at least 5 years experience working in one or more of the following fields, which shall be balanced amongst the PVC members:
 - Environmental science, mechanical or chemical engineering related generally to the environmental characteristics or impacts of products, product manufacturing or product recycling and disposal
 - Product ecology, product stewardship, product environmental regulatory requirements or related fields
 - The design, manufacturing technologies and operating characteristics of electronic products or components.

Desired qualifications – at least one member shall bring each of these qualifications:

- Knowledge of IEEE 1680 and the development of EPEAT
- Experience or knowledge in standard setting or conformity assessment to a standard
- An interest and commitment to environmental protection, resource conservation, energy efficiency or related fields

1.2.2. PVC Member Solicitation Process

Candidates shall be solicited from and through the following professions and institutions:

- Academic institutions with a specialty in electronics and in products and the environment
- Electronics industry and environmental associations and organizations
- Electronics materials, components or end-product manufacturers, but not including manufactures of products included in the scope of IEEE 1680, nor products for which a new environmental standard are currently under development, nor manufacturers of components that are directly supplied to such manufacturers.
- Consulting firms and testing labs (minding the independence requirement);
- National laboratories (Lawrence Livermore, Berkeley, PNW, etc.);
- Professional and Technical Societies;
- Professional networks [Development Team, etc.].

Solicitation announcements will be placed in academic and electronic trade journals. Candidates will also be solicited through extensive personal communications.

1.2.3. PVC Member Agreements

A contract will be prepared and signed with each PVC member that assures the following:

- Members shall faithfully interpret and enforce the terms of IEEE 1680 and shall in all cases work to uphold the credibility of the EPEAT Registry
- Members shall maintain their “independence” as defined in the EPEAT Operational Policies³.

² EPEAT Operational Policies, section 6.1

- Members shall be compensated for their time and reimbursed for expenses according to the terms of EPEAT Operational Policies⁴.

1.2.4. PVC Member Training

A PVC member training and orientation program shall be developed and delivered for new PVC members, which shall include:

- Written materials provided in advance including:
 - The 1680 standard and all referenced documents as well as other documents that add to an understanding of the standard
 - EPEAT Operational Polices and Operational Procedures
 - Specific documents relative to criteria in the standard
 - Documents relative to practices and procedures in standard conformance and auditing.
- Conference calls – 2x2 hour calls – to cover all essential issues in the documents
- Two-day in-person PVC training
 - Day 1: Training, orientation and approval of operational processes
 - Day 2: Resolution of standard verification issues and issuance of Standard Verification Issues and Clarifications Report

1.3. Assembling the Qualified Verifier Team

1.3.1. Qualifications of Qualified Verifiers

We expect to engage around 5 total Verifiers, depending on how many it takes to cover the range of specialties and skills.

Qualified Verifiers shall possess the following qualifications:

Required qualifications:

- Be “independent” as defined in the EPEAT Operational Policies⁵
- Be experts in the technical assessment and environmental characteristics of electronic products.
- Possess either a BS or advanced degree or equivalent and have at least 2 years experience working in one or more of the following fields:
 - Environmental science, mechanical or chemical engineering related generally to the environmental characteristics or impacts of products, product manufacturing or product recycling and disposal
 - Product ecology, product stewardship, product environmental regulatory requirements or related fields
 - The design, manufacturing technologies and operating characteristics of electronic products or components
 - Standard assessment and auditing
- Have specialized experience in one or more of the following areas. The team of Qualified Verifiers should cover most of these specialties:
 - Hazardous substances, toxicology, environmental chemistry
 - Energy conservation
 - Plastics formulations, manufacturing, and recycling

³ EPEAT Operational Policies, section 6.1

⁴ EPEAT Operational Policies, section 6.3.3

⁵ EPEAT Operational Policies, section 6.1

- Electronic recycling systems
- Environmental Management Systems, corporate environmental performance and corporate reporting evaluation
- Packaging and the environment
- Possess strong analytical and project management skills and be able and available to perform well on a tight timeline

Desired qualifications:

- Demonstrate an interest and commitment to environmental protection, resource conservation, energy efficiency or related fields

1.3.2. Qualified Verifier Recruitment Process

Candidates shall be recruited through the following institutions:

- Academic institutions with a specialty in electronics and in products and the environment
- Electronics industry and environmental associations and organizations
- Electronics materials, component, or product manufacturers, but not including manufactures of products included in the scope of IEEE 1680, nor products for which new environmental standards are currently under development, nor manufacturers of components that are directly supplied to such manufacturers.
- Consulting firms and testing labs (minding the independence requirement);
- National laboratories (Lawrence Livermore, Berkeley, PNW, etc.);
- Professional and Technical Societies.

Recruitment announcements will be placed in academic and electronic trade journals. Applicants shall also be solicited through extensive personal communications.

1.3.3. Qualified Verifier Agreements

A contract will be prepared and signed with each Qualified Verifier that assures the following:

- Qualified Verifiers shall objectively and faithfully review all assigned product verifications for conformance with the terms of IEEE 1680
- Qualified Verifiers shall maintain their “independence” as defined in the EPEAT Operational Policies⁶
- Qualified Verifiers shall be compensated on a time and materials basis such that their compensation does not influence their judgment and reimbursed for expenses according to the terms of EPEAT Operational Policies⁷.
- Terms relative to work assignments and relations with manufacturers such as maintenance of confidentiality.

1.3.4. Develop Verification Investigation Protocol

GEC will develop a document that describes the minimum procedures that are expected to be followed by Qualified Verifiers for three levels of verification investigation, and the contents of a verification report, including rationale for recommended findings. The appropriate verification level will be targeted based on need to maintain the credibility of EPEAT declarations.

⁶ EPEAT Operational Policies, section 6.1

⁷ EPEAT Operational Policies, section 6.4.2

Level 1: Desk inspection of manufacturer-provide verification evidence (most common)

Level 2: Level 1 plus empirical investigations of conformance with the Standard that may include interviews with 3rd parties (contract recyclers, suppliers, purchasers, technical experts, etc.), product examinations possibly with partial disassembly, etc.

Level 3: Levels 1 and 2 plus full analytical verification of conformance with the Standard that may include destructive disassembly, lab tests, etc.

GEC may issue a consulting contract for assistance with development of verification protocols.

1.3.5. Qualified Verifier Training

A Qualified Verifier training program, similar to PVC member training, shall be developed and delivered for new PVC members. Since verifiers will be contracted and paid for their time on a consulting basis, and will be free, under the terms of the Agreement regarding conflicts, to contract with manufacturers, they will be expected to pay a shared portion of the costs of training. Training shall include:

- Written materials provided in advance including:
 - The 1680 standard and all referenced documents as well as other documents that add to an understanding of the standard
 - EPEAT Operational Polices and Operational Procedures
 - Specific documents relative to criteria in the standard
 - Documents relative to practices and procedures in standard conformance and auditing.
- Conference calls – 2x2 hour calls – to cover all essential issues in the documents.
- Two-day in-person Qualified Verifier training will be conducted.
 - Day 1: Training and orientation
 - Day 2: Sample verifications and certification exam.

1.4. Standard Verification Issues and Clarifications Report

Prior to each round of verifications, and perhaps at other times, the PVC may, if necessary, issue a Standard Verification Issues and Clarifications Report. The purpose of this report is to provide clarifications of questions presented to the GEC regarding specific issue(s) in the 1680 Standard. A PVC Interpretation will answer a question presented to it regarding how it will interpret the standard in making a verification decision.

It is not the role of the PVC, and it is not within the scope of this report, to revise or modify the standard, nor to make decisions and rulings that are not based on the standard. Nor is it the role of the PVC to provide formal IEEE Interpretations or Explanations of the Standard. That is the function of the IEEE Working Group and other IEEE bodies. Rather, the PVC will simply provide its own view of how it will interpret specific issues about the standard that have been presented to GEC when it makes verification decisions. The PVC will base its rulings on the wording and intent of the 1680 standard. The PVC, at its option, may chose to present any issue that it wishes to the IEEE Working Group for an IEEE interpretations or explanations process.

The PVC will base its clarifications on the wording and intent of the 1680 standard. If the standard is silent or ambiguous on an issue, the PVC will decide if such issue should be presented to the IEEE Working Group for IEEE action, or if the intent and logic of the standard is sufficiently clear that it may provide clarity for verification purposes.

The GEC staff will collect such questions about standard issues as are presented to it and provide them, with recommendations, to the PVC for their action. The GEC staff will not anticipate how the PVC will rule on such clarifications, but the GEC staff may communicate to anyone who asks, in advance of the PVC meeting on the issue, what it intends to recommend to the PVC and the reasons for that recommendation.

2. Generic Plan for a Verification Round

Verification rounds will be conducted on a periodic basis. Each round will follow a similar set of steps. The steps outlined below will be followed in the Winter/Spring '07 Verification Round and may be modified or simplified based on experience for future rounds.

2.1. Frequency of Verification Rounds

The ongoing frequency of rounds will be set following and based on the experience of the initial round. There are expected to be either two or three rounds each year. Each round is expected to last a little over four months from start to finish.

Rounds will be conducted frequently to provide ongoing sampling of enough product declarations to assure the integrity and credibility of the Registry. This will be based on an assessment of the results of Round One, including the number of declarations problems encountered, the total time required and the cost. If many problems are identified in the samples selected for Round One, it will indicate the need for greater verification frequency and coverage of products. Verification will not be inexpensive and must be constrained, of course, by cost and budget. However, if more verification activity is required than was initially budgeted to maintain the accuracy and credibility of the Registry, funding to do so will be developed.

2.2. Coverage of a Verification Round

This will be defined for subsequent rounds based on the experience of the Winter/Spring '07 Round. The primary constraint for the number of verifications is expected to be the ability of the Verifiers and the PVC to thoroughly and adequately assess the findings of the investigations and make sound decisions within the four-month verification time period.

The coverage of a round will be measured in verification investigations. A *verification investigation* is defined as the verification of one criterion declaration for one product.

2.2.1. Coverage for the Winter/Spring '07 Verification Round

Distribution of Investigations by Products It is estimated that there will be between 350 – 375 products, from 15 – 16 manufacturers, on the Registry at the beginning of the Winter/Spring '07 Round. Note that many of the products registered by a given manufacturer are of a very similar type (e.g. several monitors that vary only by size or color), and their criteria declarations are identical or nearly so. It is estimated that there will be approximately 50 – 60 manufacturer product types on the Registry.

Product Investigation Goal for Winter/Spring '07 Round: At least one investigation of a product criterion will be conducted for each product type of each manufacturer on the Registry.

Distribution of Investigations by Criteria Some criteria will be selected randomly and some criteria will be selected intentionally for investigation.

Breakdown of the EPEAT criteria:

- There are total 51 criteria: 23 required and 28 optional criteria.
- 43 criteria are product criteria: 18 required and 25 optional.

- 5 required product criteria are declaration only, that is, conformance is not measured by whether a product meets the criterion but only that the required data is reported. Those 5 criteria will not be selected for the Winter/Spring '07 Round.
- 4 optional product criteria have not been declared to by any products (as of 9/22). Those 4 criteria will not be selected for the Winter/Spring '07 Round unless they are declared to by the time the round is actually initiated.
- 8 criteria are annual report (or corporate) criteria: 5 required and 3 optional.
 - None of the optional annual report criteria have been declared to.
- A total of 39 criteria will be subject to verification in the Winter/Spring '07 Round.
 - 34 product criteria and 5 annual report criteria.
 - 12 criteria are either declaration only or have not been declared to, and so will not be subject to verification.

Criteria Investigation Goal for Winter/Spring '07 Round: See Round One Verification Plan

Selection of criteria and products for investigations: A random selection process will be used to select criteria and products for investigation, so as to adequately represent a sampling of the Registry and performance criteria specified in IEEE 1680.

The intentional selection of criteria and products will be based on several criteria. The rationale for each intentional selection will be provided in the Winter/Spring '07 Plan

- Some criteria or products will be selected because a purchaser or other user has raised a question or challenge
- Some criteria for specific products will be selected because declared data suggests something questionable.
- Some criteria will be selected that are because they are considered by GEC staff to be particularly difficult to meet.

2.3. Steps of a Verification Round

The timing for the steps in a verification round start with the issuance of the Verification Plan for the round, and are numbered as “Day X”, according to elapsed days (per 7 day week). Variations of due dates will be, of course, necessary to take into consideration weekends or holidays.

The Round begins with the approval by the PVC of the Verification Plan for the Round. The Round Plan will identify the criteria that will be verified and how many products for each. It will also identify how specific products and manufacturers will be selected for verification. However, the Round Plan will identify neither the specific products nor the manufacturers. The specific products and manufacturers will not be known to the PVC through the course of the Round. Of necessity EPEAT staff and the QVs will know, but this information will be removed from all documentation provided to the PVC. PVC decisions will thus be blind to manufacturer and specific product.

1. GEC drafts Verification Plan for the Round and submits to PVC.

2. PVC meets to approve the Verification Plan for the Round. Verification henceforth proceeds on product registrations as they exist as of the date of Plan approval. Plan is provided to Board of Advisors for information. Verification Plan includes:
 - Number and type of the products to be verified
 - Guidelines for the products and the specific criteria to be verified
 - Recommended methods of investigation
 - The schedule of actions, decisions and PVC meetings.
3. GEC assigns each verification on the Plan to a QV.
4. GEC provides notification to manufacturers whose products are being verified regarding the products and the criteria that will be verified, the assigned QV for each, and the schedule of deadlines for this round. This notification may apply to a subset of the products included in the Verification Plan, with others to follow, depending on work allocations.

Note: This notification starts the clock on the verification process. Subsequent events are assigned dates from this point and will, if at all possible, proceed within the specified schedule. Such schedule may be modified by concurrence of the affected parties. [Day 0]

5. Manufacturers submit to the assigned QV(s) verification information specified in IEEE 1680-2006. [By day 30]
6. QVs work with the manufacturers to obtain any additional data that are needed, and that manufacturers are willing provide, and conduct other investigations as needed to assess conformance with the Standard. QVs submit verification reports that make a recommendation of conformance, nonconformance or other possible recommendation, and that include all supporting data, to GEC and the manufacturer. [By day 60]
7. GEC reviews QV verification reports, makes a recommendation of conformance, nonconformance or other outcome, and submits QV verification reports with supporting data, name of product and manufacturer removed, to the PVC. [By day 70]
8. PVC meets to consider GEC recommendations. [By day 80]
 - a. PVC considers the recommendations of conformance. The PVC shall be provided an itemization of all such recommendations along with the QV verification reports. PVC shall be requested to approve conformance recommendations in a block.
 - i. For those cases where the PVC recommends conformance, this is the PVC's "Final Decision" and the process ends for those products.
 - ii. For those cases where the PVC recommends a finding of nonconformance, the PVC issues a Nonconformance Finding.
 - b. PVC considers the recommendations of nonconformance. The PVC shall be provided the QV verification reports, and supporting data shall be made available.
 - i. If PVC issues a finding of conformance, then this constitutes the PVC's "Final Decision" and will end the process for those products.
 - ii. For those cases where the PVC concurs with GEC's nonconformance recommendation, PVC issues a Nonconformance Finding.

9. GEC produces and delivers the Nonconformance Finding to the manufacturer. [By day 85]
10. If manufacturer accepts Nonconformance Finding, PVC issues Final Decision of nonconformance and manufacturer un-declares the criterion or criteria that are out of conformance within 7 days, or GEC deregisters product.
11. Manufacturer has an opportunity to undertake corrective action. GEC shall cooperate with manufacturer in understanding what is required to achieve conformance with the Standard. Manufacturer provides corrective action plan to the GEC. [By day 100] Corrective action can include any of the following:
 - a. Manufacturer provides further evidence in support of conformance.
 - b. Manufacturer alters the product registration to correct the nonconformance.
 - c. Manufacturer proposes to alter the product and demonstrate that it will achieve conformance. Manufacturer will be directed to archive the registration until the product is brought into conformance. Additional time may be necessary as well as a confirming investigation.
12. GEC reports back, with recommendations, to PVC regarding the results of the corrective action. [By day 105]
13. PVC meets to consider the recommendations. [By day 115]
 - a. If further evidence was provided that, in the view of the PVC, demonstrates conformance of the product, then the PVC issues a Final Decision of conformance, the manufacturer is notified, and the nonconformance finding is stricken from the record.
 - b. If either the product or the registration of the product has been altered and the PVC determines that the product is now in conformance, then the PVC issues a Final Decision of conformance and notifies the manufacturer. The initial nonconformance finding is retained in the record, unless the required alteration of a product registration is determined by the PVC to not be a substantive change.
 - c. If no corrective action was taken by the manufacturer, or if the PVC finds that the manufacturer's actions do not change the nonconformance finding, PVC issues a Nonconformance Decision.
14. GEC notifies the manufacturer of the Nonconformance Decision. The GEC directs manufacturer to undeclare the criterion or criteria that are out of conformance. If the manufacturer fails to complete the undeclaration within 7 days of notification by GEC, GEC will deregister the product. [By day 116]
15. Manufacturer has option to appeal. The manufacturer submits appeal documentation to GEC which refers the matter and documentation to PVC. If the manufacturer appeals then their identity is made known to the PVC, thus breaking the PVC's "blind" judgment. [By day 130]
16. GEC provides all records to the PVC and the PVC issues a Final Decision on the appeal [By day 135]
 - a. If the PVC finds that the product is in conformance, then the product is re-registered and either 13a or 13b as appropriate is implemented.
 - b. If the PVC finds that the product is in non-conformance, the PVC issues a Final Nonconformance Decision.

17. PVC instructs GEC to draft and, upon their review and approval, issue a Verification Outcomes Report and other verification process reports.

18. The process is complete and there is no further appeal process available.

2.4. Verification Round Reports Issued by GEC

The following reports will be issued upon the conclusion of a verification round in accordance with the Verification Plan:

1. A Verification Outcomes Report will be posted on the website that summarizes the following statistics, not specific product results, of:
 - a. The verifications conducted
 - b. The conformance and nonconformance findings
 - c. The verification outcomes.
2. Purchasers and other parties who specifically request will be notified of the specific verification decisions and actions. Verification results, clearly noting de-registrations, will be provided on the website.

3. Particulars and Exceptions for Verification Round One

Verification Round One is recognized to be, in a sense, a pilot Round. It will be a learning experience for EPEAT staff, the PVC, QVs and subscribers. It is understood that ambiguities in the standard or misunderstandings regarding the requirements for demonstration of conformance may be encountered. In spite of this, Round One will be conducted according to all verification procedures, and will carry the full consequences of verification according to the judgments of the PVC, with the certain exceptions identified below.

In some rare cases it has been pointed out that the 1680 standard contains ambiguous language that could impact conformance findings. Where these are identified and agreed to by the PVC, the PVC may choose not to conduct a product-verification on certain criteria or portions of criteria. Should such be identified, the PVC will strongly recommend to the IEEE 1680 Workgroup that these ambiguities be resolved before additional rounds are conducted.

Secondly, there will a one-time exception in reporting verification outcomes. EPEAT will not provide the notification to “purchasers and other parties who specifically request” regarding “specific verification decisions”. Nor will the identity of specific products or manufacturers be specifically reported on the website, other than the appropriate changes or removal of product declarations. The Verification Outcomes Report with statistical results will be posted on the website, including the number and types of non-conformance decisions, but, for this one time only, the specific products determined to have a non-conformance will not be identified.