NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC Cost Effective Analysis Process (CEAP) For NERC ERO Standards

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RELIABILITY | ACCOUNTABILITY




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1. Introduction

Cost considerations are inherent in the development of Reliability Standards. One of the objectives of the NERC Cost Effective Analysis Process ("CEAP" or "Process") is to make such considerations transparent and to ensure that where decisions on Reliability Standards are made regarding cost effectiveness, these decisions are made in an open manner and are part of the standard development record.

While the reliability benefit of any one particular Reliability Standard may be small, taken together, the full battery of standards form a coherent and interdependent whole that helps ensure the reliability of the North American Bulk Power System ("BPS").Understanding the implementation costs and continuing costs of meeting compliance obligations for standards is vital to the development of these standards. Additionally, it is beneficial to industry stakeholders to identify and utilize the most cost effective methods of achieving the standards reliability objective and to afford the same industry stakeholders the ability to propose alternative methods of achieving the reliability objectives.

Regulatory authorities, federal, state and provincial, as well as the NERC Board of Trustees, Regional Entities and electric industry stakeholders have all expressed interest in a process to determine effectiveness and implementation costs of proposed or revised standards to improve reliability of facilities, resources and activities subject to NERC standards. The CEAP will also contribute to the record of standard development and become an integral part of filings with regulatory authorities providing additional needed information and justifications for the standards. Inclusion of implementation costs will also provide a sound basis to assist regulators in satisfying requirements for data that must accompany, and appear in, rulemakings (e.g. the Regulatory Flexiblity Act and Office Management and Budget requirments).

The foundation for this document was the Northeast Power Coordinating Council (NPCC) CEAP which was developed to address the NPCC Board of Director's concerns about implementation costs. The NPCC CEAP was effectively piloted and proved beneficial and has served to provide the concepts found in this NERC CEAP Guideline.

2. Purpose

The CEAP and associated implementation plan represent an initial effort towards addressing concerns regarding cost impacts (*e.g.,* implementation, maintenance, and ongoing compliance resource requirements) associated with achieving reliability objectives for facilities, resources and activities subject to NERC standards.

The purpose of the CEAP is to establish guidelines for the solicitation of input and high level data from the industry, as part of and during the standards development process, to identify more cost effective ways to achieve the same or better reliability outcomes at equal or lower costs. The CEAP is intended to allow the industry the opportunity during the drafting process to identify alternative requirements or methods for meeting a standard's reliability objective that may be (i) less costly or (ii) equally or more effective, or (iii) more efficient. The CEAP, conducted in parallel with the drafting process, should not significantly delay the development of the standard and will add supporting information and background for the NERC stakeholders, the NERC Board of Trustees, and Federal, Provincial and State Regulatory Agencies to be utilized for decision-making.

The CEAP is not intended to provide a comprehensive cost impact or benefit analysis. The CEAP is a guideline to be used for information gathering purposes only and is intended to collect beneficial data, not previously available during standards development. The CEAP is intended to augment and contribute to the efficiency and effectiveness of reliability standards and not delay or obstruct their development.

3. Process Overview

The CEAP will be conducted in two phases. Phase 1, Cost Impact Analysis ("CIA"), and Phase 2, Cost Effectiveness Analysis ("CEA"). Each phase of the CEAP will consist of a set of surveys with questions to be responded to by the industry.

The CEAP Final Report will consist of the (1) CEAP Phase 1 CIA Report and, (2) all combined CEAP Phase 2 CEA Reports.

The CEAP process will result in the production and publication of a CEAP Report, to be archived on the NERC website with the documentation related to the development of the standard.

3.1 Phase 1 Cost Impact Analysis (CIA)

Phase 1 will typically be conducted in conjunction with the Standards Authorization Request ("SAR") stage of a standard's development. The CIA is intended to collect estimated industry wide cost impacts (implementation, maintenance, and ongoing compliance resource requirements) and will evaluate potential reliability benefits of a proposed draft reliability standard. The CIA proposes an analysis of potential areas for coordination and efficiency gains in the development of proposed standards. The CIA will provide a high level "snapshot" of estimated cost impacts and mitigated reliability risks of the proposed reliability standard by soliciting input from stakeholders.

Questions posed during the Phase 1 CIA will focus on potential cost impacts and reliability risks to determine if the standard, in the view of stakeholders, would achieve or possibly exceed an Adequate Level of Reliability ("ALR"). Cost information collected in this phase should be "order of magnitude costs" to determine if a proposed standard will have excessive costs associated with it.

3.2 Phase 2 Cost Effectiveness Analysis (CEA)

The purpose of the CEA is to provide information about cost impacts (*e.g.*, implementation, maintenance, and ongoing compliance resource requirements) of draft reliability standards and their relative effectiveness, which will allow the industry to evaluate and propose alternative approaches for achieving the reliability objectives of the standard. Phase 2 will typically be conducted at the time of the first combined Formal Comment period and Ballot.

The CEA will involve two sets of survey questions which will be asked concurrently. The first set relates to technical feasibility and effectiveness of the proposed requirements as well as soliciting possible more cost effective alternatives to achieve the reliability objectives. The second set of questions will solicit cost impacts (*e.g.*, implementation, maintenance, and ongoing compliance resource requirements) and any related implementation information.

3.3 Cost Effective Analysis Process (CEAP) Report

All information provided during the CIA and CEA phases of the CEAP will be consolidated and evaluated to produce a CEAP report. The CEAP report will be provided to the NERC Standards Committee ("SC") and to the Standard Drafting Team ("SDT") for informational purposes.

All available resources will be utilized effectively and efficiently to produce a CEAP report in a timely manner that does not create unnecessary delays to the standards development process. It must be emphasized that the purpose of the CEAP is not to provide impediments to the NERC standard development process, but rather to inform stakeholders and decision makers of proposed industry cost impact and provide an opportunity for suggestions of alternate methods to achieve equally effective

reliability goals and objectives that may result in less costly implementation. The final report is not intended to be analytical in nature but to promote better judgment and decision-making.

4. Confidentiality

All of the cost impact information submitted by entities will be reviewed and compiled prior to being made public, or presented to the SC and the SDT. The collection, review and compilation of information will be performed in conformance to all applicable requirements of Section 1500 of the NERC Rules of Procedure. Market sensitive issues of individual stakeholders may exist or be provided through the responses to the CEAP questions. All necessary confidentiality will be maintained, and no market sensitive information or Critical Energy Infrastructure Information ("CEII") will be included in the final public report. Responders should identify confidential CEII or market sensitive information in their responses.

5. Process Details

5.1 NERC CEAP Process (See Figure 1: CEAP Process Flowchart)

1) When a draft SAR is posted for a thirty (30) day comment period, a set of CIA questions (Phase 1 of the CEAP) based on the sample questions in Appendix B, (as amended on a case-specific basis to reflect the contents of the SAR), will be posted for stakeholder review and response.

2) The responses will be evaluated and consolidated into the CIA report and submitted to the SC and to the SDT for informational purposes. The CIA report will be posted as part of a standard's development record.

3) The SDT in conjunction with the NERC Standards Development Advisor will initiate the CEA phase (Phase 2 of the CEAP). The CEA phase will typically be conducted during the first combined formal comment period and ballot.

4) The NERC Standards Development Advisor, will complete the CEAP Process Control Document (see Appendix A for template) outlining the expectations for the development of the final CEAP report. The NERC Standards Development Advisor will use the CEAP Process Control document to provide oversight of the CEA.

5) Under the guidance of the NERC Standards Development Advisor and the CEAP Process Control document the SDT will develop a set of survey questions using the template in Appendix B (as amended on a case-specific basis) and adding any other questions that may be necessary to

identify the impact (*i.e*., operational, implementation costs, resources, maintenance costs, ongoing compliance costs, etc.) of the proposed standard's requirements on a requirement by requirement basis. The surveys should be designed such that its results provide:

i. An indication of what cost impact would be associated with the individual requirements in the standard, if approved.
ii. An indication of the entities' estimates of what resources and timeframes might be needed to comply with a standard's requirements and provide information on the time the entities might need to implement the requirements of the standard, and develop documentation regarding compliance. This input would consider not only technical but budgetary concerns. The timeframe would provide further input to the SDT's Implementation Plan.
iii. The identification of potential alternative reliability requirements that could more cost effectively achieve the same reliability objective, and provide justifications, as well as any potential adverse impacts or unintended consequences, if any, that may result directly, or indirectly.
iv. The identification of any market or regulatory issues that may exist and how they could affect the standard's requirements or applicability.

6) The CEA survey questions, along with all pertinent information, will be posted (i) concurrently with the first formal comment period and ballot and (ii) on an as-needed basis to reflect modifications to the proposed reliability standard.

7) Survey results will be evaluated and consolidated into the CEA report with due consideration of any market sensitive information.

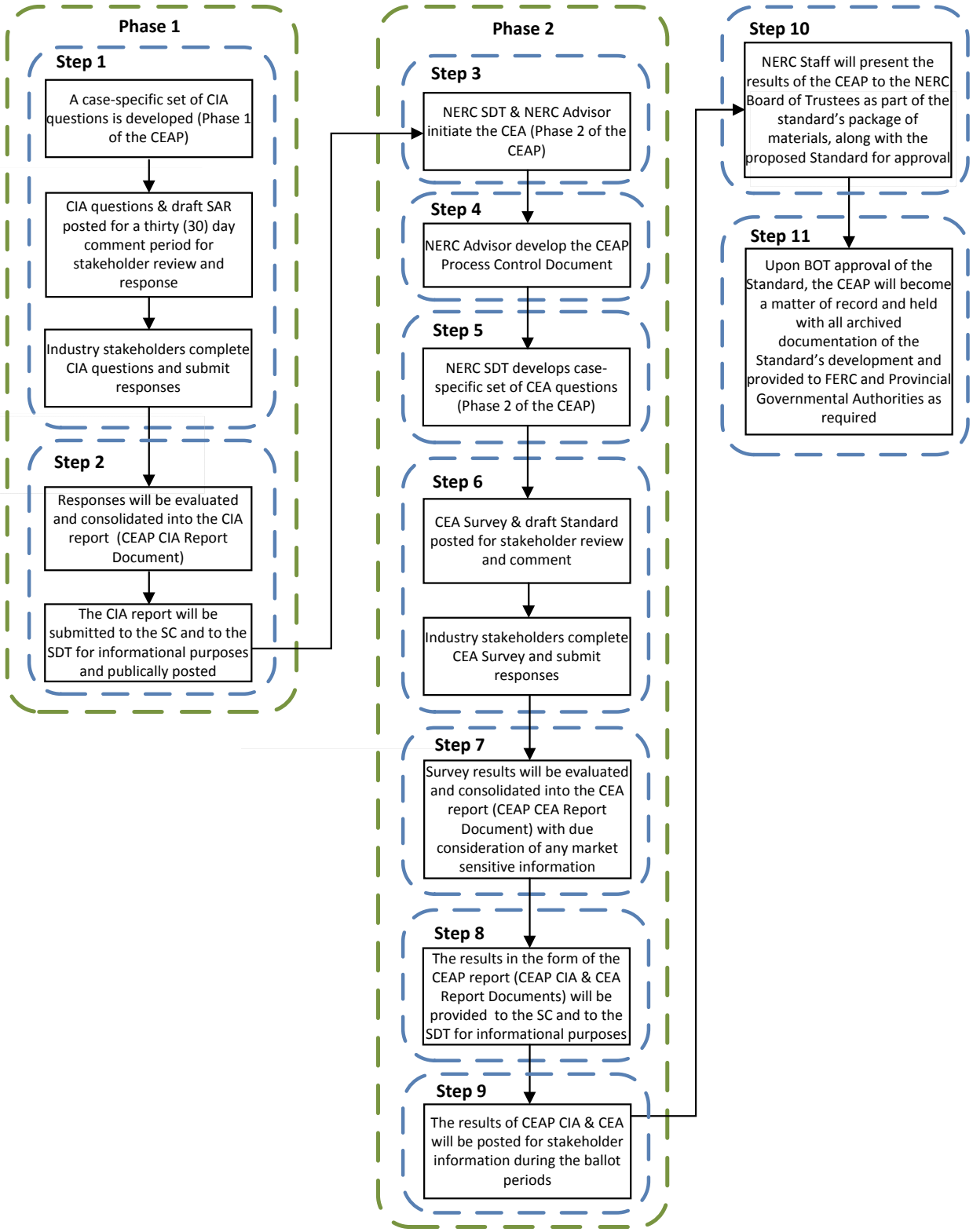
8) Upon completion of the CEA, the results in the form of the CEAP report will be provided to the SC and the SDT for informational purposes. If insufficient responses are received, this will be noted in the CEAP report. The format for the report is set forth in Appendix C of this document.

9) The SC will authorize posting of the CEAP report prior to or concurrent with the successive or recirculation ballot.

10) NERC Staff will present the final CEAP report to the NERC Board of Trustees ("BOT") as part of a standard's package of materials, along with the proposed standard for approval.

11) Upon BOT approval of the standard, the CEAP will become a matter of record and will be held with all archived information in the standard's development record and provided to the FERC and applicable Governmental Authorities as required. The CEAP is informational and is not in itself approved by FERC or the applicable Governmental Authorities.

5.2 *Figure 1: CEAP Process Flowchart*



5.3 Considerations for the CEAP Report

In developing the reports for Phase 1 of the CEAP ("CIA") and Phase 2 ("CEA") the Standards Committee Process Subcommittee ("SCPS") or other SC designee(s), will utilize any and all available and approved data and tools which may be necessary to extrapolate from incomplete responses, or leverage historical and "snapshot" data and available information to produce an informative report. The CEAP should focus on data related to facilities and other resources and activities subject to the NERC standards.

Items that may be used when developing the report and Staff recommendation may consist of, but not be limited to the following:

i. Adequate Level of Reliability (ALR) Metrics
ii. Transmission Availability Data System (TADS), Generating Availability Data System (GADS) and Demand Response Availability Data System (DADS) databases Filings of the Energy Information Administration EIA411 Form Data which includes information regarding quantities of resources and transmission miles by voltage class
iii. Event, condition, and performance driven indices being developed
iv. Historical Compliance or Event Analysis information
v. Published "Lessons Learned"
vi. Standards Issues Database

Examples of how some of the above may be used, include, but are not limited to, the following;

i. Use of "averaging" when insufficient data may have been submitted by stakeholders. In some instances it may be sufficient to provide a "typical" cost impact for a Transmission Owner with "X" number of miles of transmission, or a Generator capable of "X" MW. Ranges instead of discrete cost impacts such as Transmission Owners' costs ranged between $X and $Y dollars per miles of transmission may be used. Regional characteristics will be taken into consideration to ensure that "averaging" does not produce a misleading perception of results.
ii. Extrapolating when insufficient data may have been submitted by stakeholders by determining total Generation or Transmission circuit miles by voltage class and estimating from the responses given total potential industry cost impact. Energy Information Administration EIA411 Data that NERC currently compiles could provide this "total" data and submitted data could be extrapolated to arrive at approximate industry cost impact.
iii. If the evaluation required extrapolation, estimation or averaging of data to provide useful information, the methods will be documented in the CEAP report for reference.

Data characteristics could include:

- Transmission Owner/Transmission Operator – Approximate miles of transmission lines. (Number of interconnections?) (Number of Stations?)

NOTE: The cost difference for overhead vs. underground might require a divided classification of cost, e.g., $X per overhead mile of transmission operated at 200kV and above.

- Generator Owner/Generator Operator – Aggregate gross capacity of generation resources (MVA).

NOTE: Standards may impact different technologies differently. Costs might have to be classified by generation type, e.g., Nuclear $Y per MW, GT's $Z per MW.

- Load Serving Entity/Distribution Provider – Peak loading (MW).
- Reliability Coordinator/Balancing Authority/Planning Authority – Approximate miles of transmission lines & aggregate gross capacity of generation resources (MVA).

Appendix A

CEAP Process Control

Draft Standard Title/Project Number _____

Standard Type (i.e. Planning- TPL, Protection-PRC, etc.) _____

Applicability (i.e. TOP, GO, TO, etc.) _____

Suggested Additional Outreach* for Survey-Posting _____

Specific Issues to Address _____

Identification of Market Sensitive or Confidential Issues to Consider for Report _____

_____

* The NERC Standards Development Advisor in conjunction with the SDT will determine if any additional industry outreach is necessary. Additional outreach may include contacting Trade Groups (NAGF, NATF, NRECA, APPA, EEI, ISO/RTO Council, etc.) or specifically impacted entities or segments to encourage their participation in the CEAP process.

CEAP Documentation--SC/NERC Staff Project Management of CEAP (Example only)

The NERC Standards Development Advisor will complete the CEAP Process Control Document outlining the expectations for the development of the final CEAP report. The NERC Standards Development Advisor will use the CEAP Process Control document to provide oversight, management, and documentation of the CEAP.

1) CEAP Phase 1 Cost Impact Analysis (CIA)

Date SAR was Approved for posting by the SC _____

Date Phase 1 CEAP, CIA, Initiated _____

Date of Posting for Comment _____

Date CIA report provided to SC _____

Date SAR was Authorized for Standard Development _____

Date CIA Report Provided to SC and SDT _____

2) CEAP Phase 2 Cost Effectiveness Assessment (CEA)

SC and NERC Staff to Develop CEAP Process Control document, Date Completed

_____

SC Directs NERC Staff to Post Survey for CEA information, (during the first combined formal comment period and ballot) Post Period _____

NERC Staff Compiles CEAP draft Report, Date Provided to SC and SDT

_____

Date Final CEAP report published_____

Date of submission of approved standard and all supporting materials, including Final CEAP report, to the BOT for approval. _____

Appendix B

Sample CIA and CEA Questions

Sample CIA Questions (Additional questions may be included as appropriate):

(Respondents should identify their responses they believe to be CEII, market sensitive, or otherwise confidential.)

1) What approximate incremental one-time and ongoing estimated potential cost impacts are associated with the following: (Please be as specific as possible)

   (a) Implementation costs

   (b) Maintenance costs

   (c) Ongoing Compliance Resource Requirements

2) Are there alternative method(s) or existing reliability standard requirement(s) not identified in the SAR that may achieve the reliability objective? Please explain.

3) Would a technical guideline or "best practices" whitepaper or a training program be effective in achieving a desired outcome to meet the reliability need, as opposed to a "continent-wide" standard? If so, please explain why.

4) What level of reliability related risk exposure of the interconnected transmission network is being addressed by the standard (*i.e.*, High, Medium, or Low)?

Sample CEA Technical Survey Questions (Additional questions may be included as appropriate):

(Respondents should identify their responses they believe to be CEII, market sensitive, or otherwise confidential.)

T-1) Do the requirements in the proposed Reliability Standard collectively achieve the reliability objective of the standard and if not, why?

T-2) Are there alternative method(s) or existing reliability standard requirement(s) not identified in the draft standard which may achieve the draft standard's reliability objective? If so, what alternatives are there and which requirements would they replace?

T-3) On a requirement by requirement basis, does each of the draft requirements, by itself, achieve or contribute to a level of reliability that is "adequate," i.e. acceptable? If so, how? If not, why not?

T-4) Are there additional "efficiencies" that could be realized for any requirement(s)? If so, which requirements, what "efficiencies," and how might they be realized?

T-5) Is there any adverse impact to reliability or any other existing NERC standard, Regional standard, Regional criteria, or in-process project draft standard(s), of which your organization is aware?

T-6) What level of reliability related risk exposure of the interconnected transmission network is being addressed by this standard? (i.e. High, Medium, or Low)

Sample CEA Cost and Implementation Questions (SDT may include additional questions as appropriate):

(Respondents should identify their responses they believe to be CEII, market sensitive, or otherwise confidential.)

CI-1) Describe the size of your organization in broad general terms, e.g. GO-Total installed MWs, TOs circuit miles by kV and total load served, etc.

CI-2) Please answer the following regarding the estimated costs and benefits of each of the proposed requirements:

CI-2a) What are the initial one time, ongoing, implementation, and maintenance costs of complying with the requirements?

CI-2b) What is the on-going long term cost impact (after implementation) of complying with the requirements in terms of equivalent full time employees (EFTE)?

CI-2c) What are the resource benefits (labor, materials, administrative) of implementing these requirements?

CI-2d) What are the reliability benefits of implementing these requirements?

CI-3) Are there alternative method(s) or existing reliability standard requirement(s) not identified in the draft standard which may achieve the reliability objective of the standard that may result in less cost impact (implementation, maintenance, and ongoing compliance resource requirements)? If so what? Please provide as much additional supporting evidence as possible.

CI-4) How long would it take your organization to implement full compliance to the standard as written? What would affect the implementation (i.e. outage scheduling, availability of materials, human resources, etc.)?

CI-5) Would a technical guideline or "best practices" whitepaper or a training program be effective in achieving a desired outcome to meet the reliability need, as opposed to a "continent-wide" standard or variance?

Appendix C

CEAP Report Document Format

The final CEAP Report should be provided in consideration of the following:

i. The total of number of respondents, their cost impacts and their capacities(relative sizes) with due consideration given to market sensitivities.
ii. Ranges or discrete cost impact per MW or circuit mile of transmission or some other factor that industry can utilize to determine an approximation for their cost impact.
iii. Total industry wide potential implementation cost impact for entities.
iv. Effectiveness of the requirements to meet the reliability objective of the standard.
v. Basis for need of the standard as identified in the CIA Phase One of the project based on probabilities of occurrence, potential severity of impact to the BES and reliability need (event, condition or performance driven).
vi. List of any alternatives considered that may have been proposed by stakeholders and not accepted by the SDT along with reasons.
vii. List any assumptions or extrapolations that may have been presented in the report which may affect the results.

If the industry responses were insufficient to provide the SC and SDT with meaningful guidance, efforts will be made to extrapolate without drawing conclusions, clearly identifying where this extrapolation may have been done in the final report.

The approach described poses questions and provides aggregated results in the form of a report to the industry for informational purposes during balloting. The report will take into consideration market sensitivities and the confidentiality of the individual responses and the respondents.

In addition, information in the final posted report will be developed by a team with the required subject matter knowledge to be able to analyze and present the data in a useful form. The report will include the total number of respondents with due regard and identification of geographic and topological reliability impacts. Upon authorization, the report will be posted along with the NERC standard during balloting**.**

CEAP Phase 1 Cost Impact Analysis (CIA) Report

I. Draft Standard Title/Project Number

II. Executive Summary

III. Standard Type (i.e. Planning- TPL, Protection-PRC, etc.)

IV. Functional Entity Applicability

V. Survey Participants

- a. Analysis of Participants
  - i. Functional Entities (quantity of each type of entity)
  - ii. Relative Sizes (e.g., miles of transmission by class, etc.)
  - iii. Geographic Locations (e.g., region, interconnections, countries, etc.)
- b. Graphical Depiction of Results

VI. CEAP Phase 1 CIA

- a. Reliability Benefit Analysis
  - i. Reliability Related Survey Questions
    1. Assumptions
    2. Data Analysis
  - ii. Results
- b. Cost Impact Analysis
  - i. Cost Related Survey Questions
    1. Assumptions
    2. Data Analysis
  - ii. Graphical Depictions of Results

VII. Conclusions for Phase 1 CIA

CEAP Phase 2 Cost Effectiveness Analysis (CEA) Report

I. Draft Standard Title/Project Number

II. Executive Summary

III. Standard Type (i.e. Planning- TPL, Protection-PRC, etc.)

IV. Functional Entity Applicability

V. Survey Participants

- a. Analysis of Participants
  - i. Functional Entities (quantity of each type of entity)
  - ii. Relative Sizes (e.g., miles of transmission by class, etc.)
  - iii. Geographic Locations (e.g., region, interconnections, countries, etc.)
- b. Graphical Depiction of Results

VI. CEAP Phase 2 CEA

- a. Standard/Requirement Technical Analysis
  - i. Technical Survey Questions
    1. Assumptions
    2. Data Analysis
  - ii. Results
- b. Cost and Implementation Analysis
  - i. Cost and Implementation Survey Questions
    1. Assumptions
    2. Data Analysis
  - ii. Graphical Depictions of Results

VII. Conclusions for Phase 2 CEA