

Bureau of Safety and Environmental Enforcement

# Best Available and Safest Technologies (BAST) Determination Process

Latest Revision Date  
November 16, 2015

## Table of Contents

BSEE BAST DETERMINATION PROCESS .....	3
STATUTORY REQUIREMENTS OF OCSLA REGARDING THE USE OF BAST .....	3
BAST DEFINITION .....	3
BAST FRAMEWORK & PRINCIPLES .....	4
BSEE BAST DETERMINATION PROCESS STAGES.....	5
Figure A: BSEE BAST DETERMINATION PROCESS FLOWCHART.....	6
BAST DETERMINATION PROCESS .....	7
STAGE 1: BAST ASSESSMENT AND INITIAL FEASIBILITY .....	7
STAGE 2: BAST EVALUATION .....	9
STAGE 3: BAST DETERMINATION .....	11
ANNEX A: Alternative Course Methods.....	14

## **BSEE BAST DETERMINATION PROCESS**

This document describes the general framework for the Best Available and Safest Technologies (BAST) Determination process that will be used by the Bureau of Safety and Environmental Enforcement (BSEE) to implement Section 21(b) of the Outer Continental Shelf Lands Act (OCSLA) Amendments of 1978.

### **STATUTORY REQUIREMENTS OF OCSLA REGARDING THE USE OF BAST**

The BAST requirement is stated in Section 21(b) of the OCSLA Amendments of 1978 as follows:

*(b) Use of best available and safest economically feasible technologies: In exercising their respective responsibilities for the artificial islands, installations, and other devices referred to in section 4(a)(1) of this Act, the Secretary, and the Secretary of the Department in which the Coast Guard is operating, shall require, on all new drilling and production operations and, wherever practicable, on existing operations, the use of the best available and safest technologies which the Secretary determines to be economically feasible, wherever failure of equipment would have a significant effect on safety, health, or the environment, except where the Secretary determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies.*

### **BAST DEFINITION**

Best available and safest technology (BAST) means the best available and safest technologies that the BSEE Director (Director) determines to be economically feasible wherever failure of equipment would have a significant effect on safety, health, or the environment. *Source: Oil and Gas and Sulphur Operations in the Outer Continental Shelf, 30 CFR 250 (July 1, 2013) and Federal Register Vol. 78 No. 163 (August 22, 2013)*<sup>1</sup>.

The word “technology” herein, includes available<sup>2</sup> equipment, systems (multiple pieces of equipment and control devices) and programs (e.g., computer software).

A BAST Determination process will specify performance level(s) for technology based on an evaluation of the best performing equipment that is currently available. The goal is to ensure that technology is properly assessed and evaluated when needed to increase the safety of operations on the OCS.

---

<sup>1</sup> This Federal Register announcement is for a proposed rulemaking and update to 30 CFR Part 250 which includes the update to 30 CFR 250.107(c).

<sup>2</sup> Available refers to existing in the marketplace and is accessible under reasonable terms and conditions.

## BAST FRAMEWORK & PRINCIPLES

The “framework and key principles” related to the implementation of the BAST Determination Process include the following:

- The Director of BSEE determines when the BAST Determination Process is initiated and makes the final determination of BAST based on the information that is provided to the Director.
- The BAST Determination Process will be used to address gaps in existing requirements (BSEE regulations or incorporated standards), the need for increased performance based on incident analysis, or innovative safety equipment that may provide significant safety improvements.
- This process will focus on the establishment of performance level(s).
- The BAST Determination Process will involve government, industry, academia, and other OCS stakeholders in a transparent evaluation of technology and performance.
- The initial BAST assessment uses incidents, technology or systems failures, or near-misses that can significantly increase safety as the basis for determining whether improvements are needed.
- The BAST Determination Process provides a structured methodology for assessing technology failures or improvements that would have a significant effect on personnel safety, health, or the environment.
- A technology must be available and its performance must be “proven”. The word “proven” may mean “field proven,” or may, in some circumstances, include technology that is capable of being proven under a non-field environment (e.g. laboratory environment).
- The BAST Determination Process will take economic factors into account through the use of an initial economic feasibility analysis and a more rigorous benefit-cost analysis to estimate the economic effects of incorporating a technology.
- A BAST Determination may be updated in subsequent years depending on the need to increase safety.
- The BAST Determination Process ***will not*** result in:
  - an automatic review of existing systems and technology,
  - the development of a prescriptive technology list, or
  - the automatic phase-out of existing technology that is not capable of meeting new performance levels.

## BSEE BAST DETERMINATION PROCESS STAGES

The BSEE BAST Determination Process<sup>3</sup>, as illustrated in Figure A, is detailed throughout this document and consists of three (3) distinct stages:

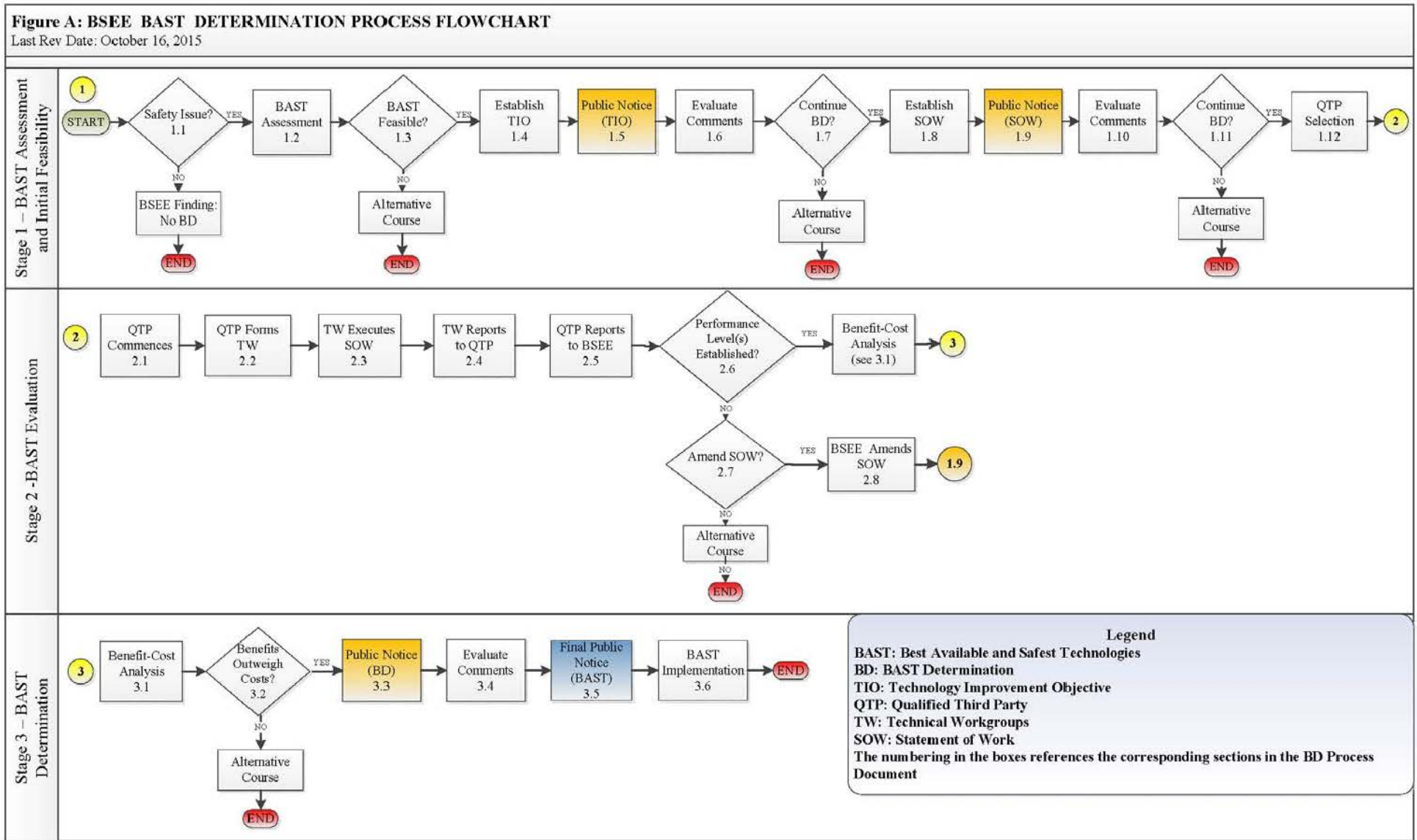
1. **BAST Assessment and Initial Feasibility** - The BAST assessment and initial feasibility stage consists of an examination of the circumstances leading to a BAST Determination, feasibility analysis, formation of a BAST technology improvement objective, and issuance of public notice(s).
2. **BAST Evaluation** - The BAST evaluation stage consists of a full assessment of BAST candidate(s)<sup>4</sup> including input from qualified third party(ies) and technical workgroups.
3. **BAST Determination** - The BAST determination stage consists of an economic benefit-cost analysis and a final decision by the Director on whether to proceed with the BAST Determination. A public notice will announce the Agency's BAST implementation.

---

<sup>3</sup> Hereafter in this document, it will be referred to simply as the BAST Determination process.

<sup>4</sup> The term "BAST candidate(s)" refers to the equipment that is being considered or undergoing the BAST Determination process.

**Figure A: BSEE BAST DETERMINATION PROCESS FLOWCHART**



## BAST DETERMINATION PROCESS

The BAST Determination Process consists of three distinct stages as explained below and depicted in Figure A, BSEE BAST Determination Process Flowchart.

### STAGE 1: BAST ASSESSMENT AND INITIAL FEASIBILITY

**1.1. Safety Issue?** On an annual basis, the Director will determine whether there are safety issues that warrant the need for a BAST Determination based on:

- Accidents, incidents, or near-miss data from domestic or international sources that indicate new or higher performance levels for safety technology may be needed to ensure safety.
- Evidence that improvements involving safety technology have been made that may significantly increase safety and that these improvements have not been accounted for in existing requirements.

**1.2. BAST Assessment.** If the Director determines that a safety improvement issue has been identified in Step 1.1 that should be considered in a BAST Determination, the Director may request that the Chief of Office of Regulatory Programs (ORP) initiate a BAST assessment. This examination will determine the likelihood that a BAST Determination would resolve significant safety issues and address the following:

- Technology Failures--Were the incidents, technology failures, or near-misses caused by a failure of technology?
- Improve safety--Would the use of better performing technologies have prevented or minimized the specific safety issue or increase safety across the OCS?
- Availability of Proven Technology--Is there sufficient information to establish the existence of better performing technologies that are currently available?
- BSEE Resources--What are the expected costs and resources necessary from BSEE to perform this BAST Determination in the anticipated timeframe for completion?
- Economic Feasibility--Is it likely that the benefit of better performing technologies will justify the implementation cost?

**1.3. BAST Feasible?** The Director will review the findings from the BAST Assessment conducted in Step 1.2 and determine whether to proceed with the BAST Determination or whether an alternative course of action outside the BAST Determination Process should be pursued (e.g. safety alert, research, revision of inspection procedures, etc.).

For more information on an alternative course of action, see Annex A, *Alternative Course Methods*.

**1.4. Establish the Technology Improvement Objective (TIO).** A BAST TIO will be developed that has the potential to improve safety, health, or environmental protection. The TIO articulates

the safety issue in the form of a question with the goal of improving safety, health, or environmental protection.

**1.5. Public Notice (TIO).** The Director will announce the BAST TIO and rationale for initiating the BAST Determination through a public notice requesting comments. Potential venues to publish this information and request comments include:

- **Notice to Lessees and Operators (NTL).** This is a formal document that provides additional information and clarification or interpretation on issues of importance to the lessees and operators.
- **www.BSEE.gov.** The agency routinely posts information and notices of proposed action on the BSEE.gov webpage for informational purposes.
- **Federal Register Notice.** BSEE issues this notice in order to receive comments from the public.
- **Public Forums.** The agency may decide to hold a public forum to further explain the BAST Determination and allow OCS stakeholders to hold discussions.

**1.6. Evaluate Comments.** Upon receipt of public comments (if any) from Step 1.5 above, BSEE will review and evaluate these comments and make a decision on any revisions.

**1.7. Continue BAST Determination?** Based on BSEE's review of the TIO comments, the Director will decide whether to continue the BAST Determination Process or if an alternative course of action outside the BAST Determination Process should be pursued.

For more information on an alternative course of action, see Annex A, *Alternative Course Methods*.

**1.8. Establish the Statement of Work (SOW).** The Agency will prepare a SOW that conveys the TIO, the required tasks, the timeline to completion, and any other necessary information.

**1.9. Public Notice (SOW).** The Director will announce the SOW through a public notice, using the same venue options identified in Step 1.5.

**1.10. Evaluate Comments.** Upon receipt of public comments (if any) on the SOW, BSEE will review and evaluate such comments and make a decision on any revisions.

**1.11. Continue BAST Determination?** Based on BSEE's review of the SOW comments, the Director will decide whether to continue the BAST Determination Process or if an alternative course of action outside the BAST Determination Process should be pursued.

For more information on an alternative course of action, see Annex A, *Alternative Course Methods*.



**1.12. QTP<sup>5</sup> Selection.** The BSEE may announce intent to solicit for QTP's using the same venue options as identified in section 1.15. BSEE may select and contract one or more Qualified Third Parties (QTP) for assistance in performing the work as stated in the SOW.

## **STAGE 2: BAST EVALUATION**

**2.1. QTP Commences.** The QTP serves as the project manager for this portion of the BAST Evaluation. QTP's responsibilities include:

- Forming one or more Technical Workgroups<sup>6</sup> (TW) to evaluate potential solutions for a specific SOW.
- Identifying additional data and testing needs regarding performance conditions (pressure, temperature, loads etc.).
- Performing outreach to appropriate industry groups, standards development organizations, original equipment manufacturers (OEMs), and third party consultants.
- Providing oversight of third party testing or statistical analysis.
- Developing proposed budgets, funding mechanisms and timelines.
- Providing BSEE with a summary of the work performed by the TW including their findings and recommendations on a periodic basis.
- Reviewing the TW's outcomes to ensure that the SOW is properly addressed and that all work is conducted within the established process.
- Providing BSEE with the TW's final report.

**2.2. QTP Forms TW.** The QTP's formation of one or more TW may be solicited through public notices and solicitations. In some instances, a TW may already exist or can be formed within a Standard Development Organization or other organizations. The QTP will decide the appropriate manner to form the TW. The TW will be comprised of individuals with technical expertise in the specific area being evaluated in the SOW. The QTP will strive for the following on each TW that is formed:

- Balance -The QTP will seek broad input and balanced representation on the TW.
- Due Process - Participation in TW activities is open to all parties (persons and organizations) that have a stake in the SOW and in contributing to the BAST Determination Process. Consideration shall be given to all written views and objections. Records of all comments and resolution of those comments shall be included in the deliverables to BSEE.
- Consensus - Consensus is established when substantial agreement has been reached by the TW membership. Substantial agreement is defined as more than a simple majority but not necessarily unanimity. Consensus requires that all views and objections be considered and that an effort be made toward their resolution. Consensus shall be defined as a majority of those eligible to vote shall have voted and approval is met with at least two-thirds of those voting, excluding abstentions.

---

<sup>5</sup> The QTP may include one or more of the following types of organizations: Offshore Energy Safety Institute (OESI), Standard Development Organizations, Certifying Entities, and/or National and Private Laboratories.

<sup>6</sup> BSEE reserves the right to participate in any and all TW formed by the QTP.

- Voting Member - Voting will be limited to one vote per member company (i.e., one person may serve on a TW representing the same company, agency, or special interest group, etc.). Any member of the TW who has materially contributed to the work product of the TW, including regular attendance, as defined by the QTP, at meetings, will be a voting member. Any voting or non-voting member, including interested parties, may comment on the work product of the TW. All comments shall be addressed and documented.
- Deliverables/Outcome - The TW will provide all documents that convey the technical information that pertains to the SOW presented by BSEE to the QTP.
- Documentation -The TW will maintain minutes of all TW meetings and will provide those minutes to the QTP. Those minutes will be made available to the public with consideration to proprietary data or other confidential or national security issues. All dissenting views will be documented

**2.3. TW Executes SOW.** The TW, established by the QTP, provides the technical input that addresses the BAST SOW. The TW is assigned the overall responsibility for developing a solution to the SOW (i.e., define the functional (operational) requirements and oversee the establishment of performance levels for testing). The TW will be comprised of individuals with technical expertise in the specific area being evaluated in the SOW. The TW will develop the functional (operational) requirement(s) that define the necessary parameters in addition to the performance level(s) in order to be fit for service in the OCS. Factors such as interface requirements, physical requirements, environmental conditions, maintainability, portability, and quality control may be included under functional (operational) requirement(s).

The performance level(s) specify how well the technology executes its intended function and to what capabilities through design, testing, or a technology's operational history.

Both functional (operational) requirements and performance levels must demonstrate repeatability and reproducibility. The performance levels of the various types of technologies are based on testing during the BAST Determination Process or on pertinent data provided by third parties. See Figure B, "Relationship of the Technology Improvement Objective to Functional (Operational) Requirements and Performance Levels" for an illustration.

The TW will compare and assess the performance levels of various types of technology that meet the functional (operational) requirement(s).

**2.4. TW Reports to QTP.** The TW reports their findings to the QTP. The QTP will address alternatives and options for functional (operational) requirements and performance level(s) based on a review of the available and proven technologies. The QTP shall not have the authority to change any finding(s) made by the TW.

**2.5. QTP Reports to BSEE.** The QTP will provide BSEE with a summary of the work performed by the TW including their findings, recommendations, and any dissenting opinions. Any concerns may be outlined in the forwarding letter from QTP to BSEE.

**2.6. Performance Level(s) Established?** The BSEE will evaluate the QTP's and TW's work, findings, and recommendations to identify the appropriate course of action. Based on BSEE's evaluation one of the following will be determined:

- If there is a recommended performance level requirement based on an evaluation of available technology that satisfies the SOW, BSEE will initiate a benefit-cost analysis. The BAST Determination Process moves to the Stage 3- BAST Determination.
- If BSEE determines that there is not sufficient data to determine a performance level requirement based on the evaluation of available technology, BSEE will then determine if the SOW should be amended.

**2.7. Amend SOW?** The BSEE will decide on one of the following if the SOW does not sufficiently address the functional (operational) requirement(s) and/or performance level(s):

- BSEE will amend the SOW to address additional design, testing, verification, or operational history; or
- BSEE will recommend an alternative course of action outside the BAST Determination Process.

For more information on an alternative course of action, see Annex A, *Alternative Course Methods*.

**2.8. BSEE Amends SOW.** Once the SOW is amended the BAST Determination Process would return to Step 1.9.

### **STAGE 3: BAST DETERMINATION**

**3.1. Benefit-Cost Analysis.** The BSEE will perform a benefit-cost analysis consistent with OCSLA requirements that assesses the incremental benefit-cost of the BAST candidate.

**3.2. Benefits Outweigh Costs?** The Director will decide on one of the following as a result of the benefit-cost analysis conducted in Step 3.1:

- If the Director determines that implementation of the proposed performance level requirement does not meet the OCSLA benefit-cost analysis (e.g., the benefits do not outweigh the costs), BSEE will not proceed with the issuance of a BAST Determination. The BSEE will recommend an alternative course of action outside the BAST Determination should be pursued (e.g. safety alert, research, revision of inspection procedures, etc.).

For more information on an alternative course of action, see Annex A, *Alternative Course Methods*.

- If the Director determines that the proposed performance level requirement meets the OCSLA benefit-cost analysis, BSEE will proceed with a public notice for the BAST Determination stating the TIO, performance level, and implementation schedule.

**3.3. Public Notice (BD).** The Director will announce the BAST Determination through a public notice and request comments regarding the BAST Determination. Potential venues to publish this information and request comments include:

- **Notice to Lessees and Operators (NTL).** This is a formal document that provides additional information and clarification or interpretation on issues of importance to the lessees and operators.
- **www.BSEE.gov.** The agency routinely posts information and notices of proposed action on the BSEE.gov webpage for informational purposes.
- **Federal Register Notice.** BSEE issues this notice in order to receive comments from the public.
- **Public Forums.** The agency may decide to hold a public forum to further explain the BAST Determination and allow OCS stakeholders to hold discussions.

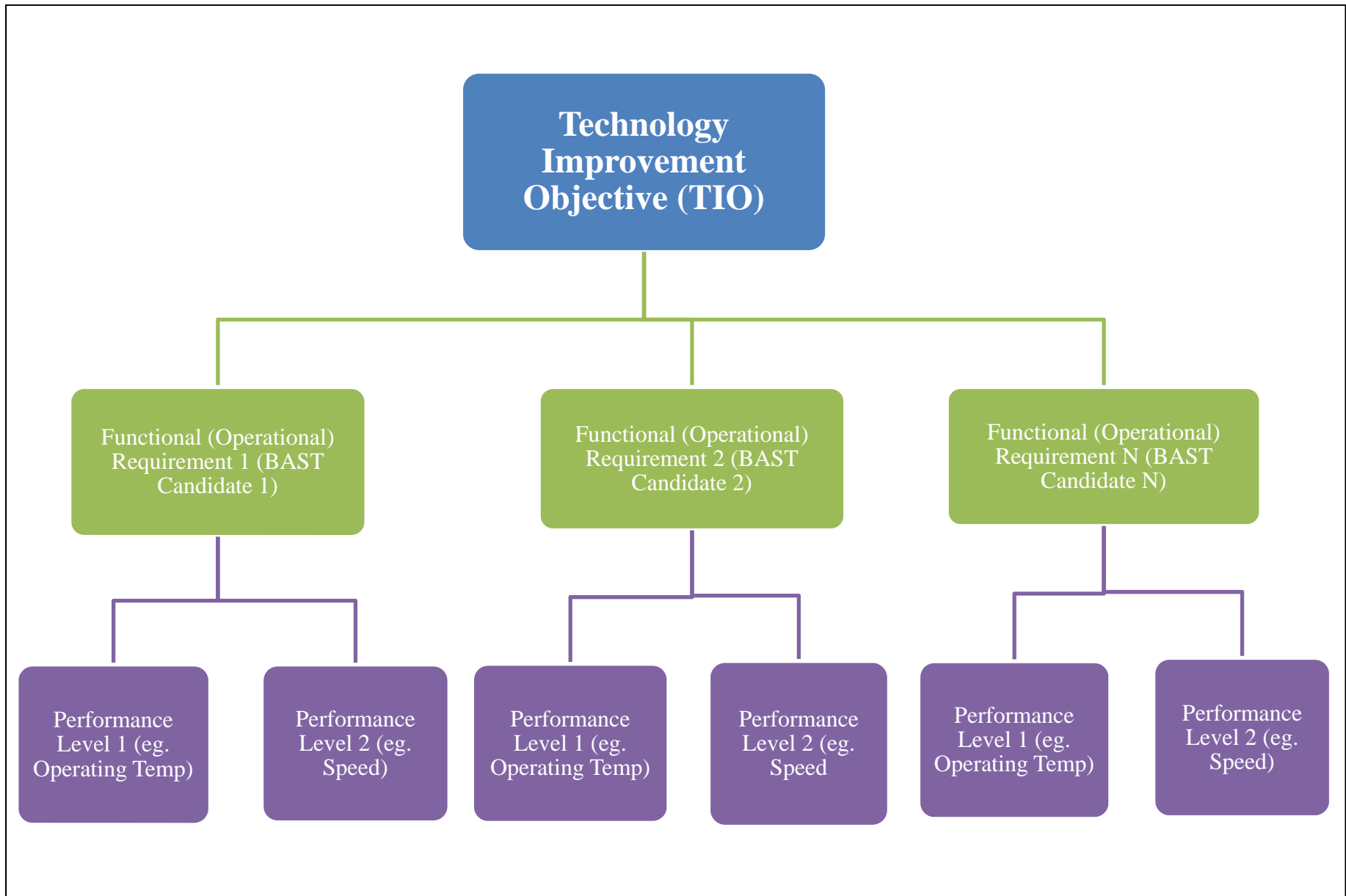
**3.4. Evaluate Comments.** Upon receipt of public comments (if any) from Step 3.3, BSEE will review and evaluate the comments and determine the appropriate action to take.

**3.5 Final Public Notice (BAST).** Once BSEE has determined the appropriate action to take the agency will publish, a final public notice regarding the BAST Determination, including an implementation schedule, through one of the following potential venues:

- **Notice to Lessees and Operators (NTL).** This is a formal document that provides additional information and clarification or interpretation on issues of importance to the lessees and operators.
- **www.BSEE.gov.** The agency routinely posts information and notices of proposed action on the BSEE.gov webpage for informational purposes.
- **Federal Register Notice.** BSEE issues this notice in order to receive comments from the public.
- **Public Forums.** The agency may decide to hold a public forum to further explain the BAST Determination and implementation schedule.

**3.6. BAST Implementation.** After a BAST Determination is effective, operators will be required to use technology that meets the BAST performance requirement(s) on new and, wherever practicable, existing operations. Operators will have the opportunity to request a waiver of the new BAST requirement(s) on existing facilities by submitting appropriate documentations to the Chief of Office of Regulatory Programs.

**Figure B. Relationship of the Technology Improvement Objective to Functional (Operational) Requirements and Performance Levels.**



## **ANNEX A: Alternative Course Methods**

### **Addressing Technology Failures outside the BAST Determination Process**

One of the outcomes of the BAST Determination Process is an “Alternative Course”. Under this scenario, the BSEE, the QTP, or the TW determines that there is an important safety issue to address outside the scope of the BSEE BAST Determination Process. These methods may include the following:

- a. Issuance of BSEE “Safety Alert” or similar industry issued “Alerts/Notices”,
- b. Development by BSEE or Industry of revised maintenance, inspection, and operational procedures (including operating ranges),
- c. Development by industry of new/revised standards,
- d. Request to BSEE or industry for a research and development project,
- e. Implementation by BSEE of conditions of approval in plans/permits submitted to the agency,
- f. Development by BSEE of new/revised regulations.