System Personnel Training Standard Drafting Team Meeting

July 24, 2007 — 10:30 am to 12:00 pm Eastern Daylight Time

Web Conference Agenda

Consortium conference server: 1(732)694-2061
Conference code: 1208072407

Web Ex Meeting Number: 716 508 600
Meeting password: training

1) Administrative
   a) Introduction of Participants
   b) Review Antitrust Guidelines (Attachment 1)
   c) Review Meeting Objectives:
      i) Review Performance Requirements Reference
      ii) Review Compliance Comments on Draft 2 of Standard
      iii) Review Compliance Comments on Response to Comments
2) Review Performance Requirements Reference (Attachment 2)
3) Review Compliance Comments on Standard Version 2 (Attachment 3)
4) Review Compliance Comments on Response to Comments (Attachment 4)
5) Discuss Next Steps

116-390 Village Boulevard, Princeton, New Jersey 08540-5721
Phone: 609.452.8060 ▪ Fax: 609.452.9550 ▪ www.nerc.com

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NERC Antitrust Compliance Guidelines

I. General

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

II. Prohibited Activities

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.
- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers.

III. Activities That Are Permitted

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and

adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation, Bylaws, and Rules of Procedure are followed in conducting NERC business.

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of the mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.
- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.
- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.
- Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

A Guide for Determining Task Performance Requirements

Author: John P. Taylor (2007). Reference for NERC Standard PER-005. Add webpage

Introduction

Purpose

The purpose of this reference is to provide instruction in writing the performance standard (or criteria) part of a task statement, which will reliably describe the desired outcomes of performing tasks. The reader will be taken through a systematic approach to writing performance standards that includes the phases of:

Identify the type of performance required

Determine the minimum level of acceptable performance

State the standard (criteria) for acceptable performance in either measurable or observable terms

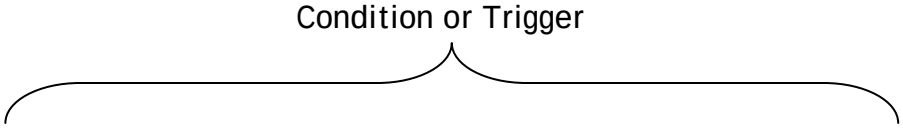
Terms

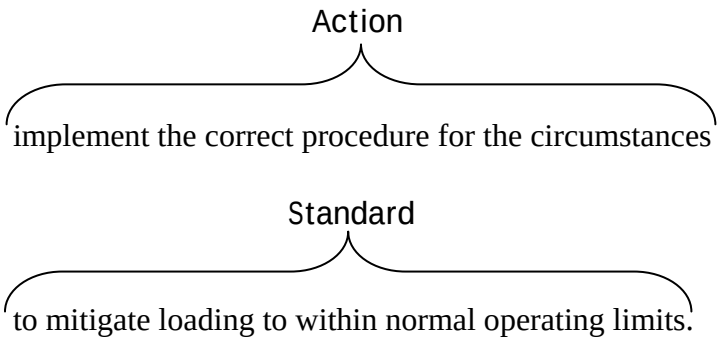
A performance standard is part of a task statement. A task statement includes the three elements of Condition (events, givens, or triggers that call for action), the Action (taken by the performer), and the Standard of Performance (measure of successful performance).

A task statement, simply put, states "When this happens or at this designated time (Condition), do this (Action), this well (Standard). Some examples of task statements are given below. The examples used are generic in nature and are intended to demonstrate the form and structure only of a performance standard. The performance standards that the reader develops would include specific information relevant to the reader's organization such as the names of existing facilities and the names of procedures that apply to them

> Given a System Operating Limit violation on the transmission system, implement the correct procedure for the circumstances to mitigate loading to within normal operating limits.

The elements of the above task statement are:





Other examples:

> Given a new transmission reservation request, evaluate the request for adequate available transmission capacity per company business rules and in compliance with NERC and NAESB standards.
>
> Given a tag submitted for scheduling, ensure that all transmission rights are assigned to the tag per the company Tariff and in compliance with NERC and NAESB standards.

Clear standards of performance are necessary for an individual to know when he or she has completed the task, and to ensure agreement between employees and supervision on the objective of a task. Performance standards answer questions such as:

How timely must it be done?
Or
How accurately must it be done?
Or
What quality must it be done with?
Or
What response from the customer must be accomplished?

To write performance standards, the nature of the performance is first identified, then measures or standards of acceptable performance can be written that match the type performance.

The Characteristics of Performance Standards

Type of Performance

Performance standards have three traits that are critical – type of performance the measure is intended to validate, the level of performance the measure is intended to validate, and the measurability of the standard.

The nature of the performance standard should match the nature of the performance. Is the performance of a cognitive (mental), psychomotor (combination of mental and physical), or affective (behavioral) nature, or some combination of the three?

Why is it important to determine the type of performance? The type of measure used will depend on the type of performance. For example, if the task is to apply a rule or policy, the task is primarily cognitive in nature, and the measure of success is the quality of the performance – was the correct rule applied under the circumstances? By contrast, if the task is to switch a breaker in a substation correctly, the task is a combination of cognitive and psychomotor. The person must understand which breaker to switch and how it is switched (cognitive), and they must be able to physically switch the breaker (psychomotor). The psychomotor aspect of the task requires observation of performance.

If a task relies heavily on the person behaving a certain way (because they value some principle or policy of the company), it will have an affective nature, For example, when a reliability coordinator (RC) is communicating with a balancing authority in regard to a transmission system overload that is primarily a local problem, the RC offers assistance and suggestions but does not order the Balancing Authority (BA) to take specific action. This requires that the RC values the autonomy of the BA in that situation. The measure for this type performance is not only were the suggestions correct, but were they delivered in a professional and courteous manner as measured by the BA's response. The measure may not be as quantifiable as some, but it is still observable.

More detail is provided on the nature of performance in Attachment A.

Level of Performance

Once the nature of the performance is identified, the level of performance can be determined. The focus here is on the Action element of the task statement. What does the person actually do? If it is cognitive in nature, at what level of cognition must he or she be capable of performing in this situation? Does the action require understanding a concept, applying a rule, or analyzing data? If the performance is primarily psychomotor, must the task be done accurately, or timely, or both? These are different levels of psychomotor performance.

If the level of performance of a task is at the analysis level of cognition and the measure of performance written to be at the comprehension level, then the wrong level of measure would be used. Again refer to Attachment A for determining the level of performance.

Measurability

The third characteristic of a task measure is its ability to be validated as achieved. Performance can be either measurable or observable. The standard types of measures used for tasks include: quality, quantity, timeliness, cost, and impact. Performance that is primarily cognitive in nature can be measured in terms of quality (correct or incorrect, some percentage of correct responses, correct outcome, etc,).

Performance that is psychomotor in nature can be measured in terms of quality, done correctly, with the additional parameters of amount of instruction needed and timeliness.

Performance that has an affective nature is heavily dependant on the impact it has on a customer or peers. Affective performance can be measured quantitatively - was the customer satisfied or not, how satisfied on a scale of 1-5, did they respond in the desired manner. Often time affective performance is not measurable quantitatively, but is

observable – did the employee follow the company policy, did the employee interact with their customer such that the objective was achieved?

Steps in Writing Performance Standards

Construct a task statement by answering the following questions.

Conditions

When is the task started? Is it at an appointed time? Is it when a particular event or condition occurs? What triggers action?

Examples:

Given a request for a planned outage of a transmission line . . . .

When a flowgate exceeds its IROL . . . . .

When voltage on the bulk transmission system drops more than 5% . . . . .

Action

What action should be taken? Is it primarily a decision? Is it purely cognitive in nature? Is the action both cognitive and psychomotor? What verb best describes the action at the correct level of Cognition, Psychomotor skill, or Affective behavior? The verb used to describe the action is important. See Attachment B for some samples.

Examples:

(Given a request for a planned outage of a transmission line), approve or deny the request for a planned outage of a transmission line . . . . .

(When a flowgate exceeds its IROL), implement load reduction measures . . . . .

(When voltage on the bulk transmission system drops more than 5%), implement measures to raise voltage . . . . .

Standard

What measure will match the nature of the performance? Is the standard for this performance measurable? Is it observable? Can it be quantified? Can it be adequately described to be qualitatively observable? Does it need to be done correctly? Does it need to have a certain percentage of correct responses? Is time of performance a factor? Is behavior in acting important? Are there strong company values that must be followed?

Examples:
(Given a request for a planned outage of a transmission line, approve or deny the request for a planned outage of a transmission line) based on the projected impact on loading of other lines in the footprint.

(When a flowgate exceeds its IROL, implement load reduction measures) that bring loading on the IROL flowgate below the IROL within 30 minutes.

(When voltage on the bulk transmission system varies more than 5% of nominal, implement measures to return voltage) to within ±5%.

Attachment A

Characteristics of a Performance Standard

The performance standard in a task statement will have three essential characteristics - type of performance required, level of performance required, and the ability to be validated as achieved. The nature of the desired performance and associated measures will be either cognitive, psychomotor, or affective, or some combination of the three. The reason for identifying the nature of the performance is to be able to describe it such that the type of outcome desired will be understood by both employees and management. We first identify the nature of the action in a performance statement.

Nature of Performance

Cognitive performance is of the nature that requires knowledge to achieve, such as applying the correct rule or policy in a situation. The person performing must know the rules or policies and be able to distinguish the characteristics of the situation such that they choose the correct policy for the situation. This is a cognitive or purely mental capability. An example would be correctly processing a transmission reservation request according to the company's Tariff.

The task may also require the successful performance of a psychomotor or physical action, such as navigating through a computer program in a timely manner to execute the decision made. Another example would be correctly operating circuit breakers at a substation. Correctly grounding a de-energized circuit before working on it is another example.

The desired outcome may also require some degree of valuing or interactive capability, such as interacting with a customer in such a way that the customer is satisfied when the task is completed. This may require that the performer values the company value of satisfying customers within the bounds set by the company and communicated to customers as what they can expect. An example would be a reliability coordinator directing the re-dispatch of specific generation to relieve and IROL by acting in a professional but firm manner with the Balancing Authority.

Levels of Performance

Once you have identified the nature of the performance to be cognitive, psychomotor, affective, or a combination, you can determine the level of performance needed to achieve the outcome desired.

Cognitive Performance

For a task that is strictly cognitive in nature, the performance level can be identified using taxonomy (progression of levels in order of complexity) such as Bloom's Taxonomy. Bloom's Taxonomy lists the level of cognitive function (or levels of thinking) from simplest to most complex as:

Knowledge
Comprehension
Application
Analysis
Synthesis
Evaluation

Knowledge is the ability to recall facts and data. It requires simple memorization, such as the definition of a word. It is demonstrated by stating the definition correctly. Understanding the definition is not necessary to be at the knowledge level. Simply repeating back what was said or read is all that is required at this level of cognition. An example of knowledge would be stating the time limit for an E-tag to be submitted. Some verbs used to describe demonstration of the knowledge level of cognition are state, define, list, name, and recall. See Attachment A for more examples of verbs.

Comprehension is an understanding at the level that a person can explain a concept or term, not just repeating the definition of it. When a person can explain something in their own words they comprehend the term or concept. Rules and policies are considered concepts. In contrast, following a procedure without needing to understand it is simply having knowledge. An example of comprehension is an understanding of the concept of a tariff charge for using someone else's transmission system as comprehension of the concept of open-access transmission service as required by FERC Order 880. Explain, discuss, distinguish, associate, and translate are verbs used to describe the demonstration of the comprehension level of cognition.

Application is using rules or concepts, applying the correct rule or concept for the situation. Rules may be simple or complex, with complex rule using a higher level of cognition than a simple rule using. Formulas are considered rules, so solving equations may be considered the application level of cognition. Applying the electrical formula for the relationship between real (or true) power and reactive power to calculate the total power on a circuit is applying the formula:

$$\text{Apparent Power (VA)} = \sqrt{\text{True Power (W)}^2 + \text{Reactive Power (VAR)}^2}$$

Solving routine problems is also considered the application level of cognition. Apply, calculate, relate, solve, and utilize are verbs used to describe the demonstration of the application level of cognition.

Analysis is the ability to dissect information into discernable parts which make up the body of information, including the relationships between parts. For example, a simple analysis of transmission system alarms is that when a breaker alarm activates at both ends of a line, there should be a line loss alarm activating shortly thereafter. Another example would be reviewing the information surrounding the line loss to determine the cause for the loss. Higher level problem solving occurs at the Analysis level of cognition. Order, analyze, detect, separate, and construct are verbs used to describe the demonstration of the analysis level of cognition.

Synthesis, simply put, is the merging of more than one rule to develop a new rule, or putting together several parts into a whole piece. Synthesis usually involves pattern recognition, and at a high level, a pattern not previously known by the person. An

example would be describing the reason for an unexpected response of a transmission line to a certain type loading resulting in flow characteristics that were not predicted by existing knowledge. A simpler example would be a reliability coordinator putting together data being received on their EMS and other tools to form a correct conclusion about the condition of the transmission grid. Combine, design, develop, generalize, and integrate are verbs used to describe the demonstration of the synthesis level of cognition.

Evaluation is the highest level of cognition, describing the ability to judge the value of information or an approach to solving a problem. Evaluation is required in a dynamic, changing environment to determine how to maintain control of changing conditions within prescribed parameters. An example would be of an air traffic controller in an unusually high level of airplane activity. Another example would be a Bulk Electrical System operator maintaining balance between generation and load under circumstances not experienced by the individual before. Determine, appraise, evaluate, and judge are examples of verbs used to describe the demonstration of the evaluation level of cognition.

Psychomotor Performance

In the history of our civilization, the assembly lines and mass production of the industrial revolution had a large impact on the workforce. In an effort to determine the levels of complexity when task performance involved both the physical and mental capabilities of individuals, various efforts to identify and organize the levels of psychomotor performance produced primarily three taxonomies for psychomotor skill performance. One of the three is included in this guide because to this author it seems to be the simpler model and more easily measured. The taxonomy is presented in the table below.

- Dave, R. (1967). *Psychomotor domain*. Berlin: International Conference of Educational Testing.

Level	Definition	Possible Verbs
1. Imitate	Observe a skill and attempt to repeat it, or see a finished product and attempt to replicate it while attending to an exemplar.	Attempt, copy, duplicate, imitate, mimic
2. Manipulate	Perform the skill or produce the product in a recognizable fashion by following general instructions rather than observation.	Complete, follow, play, perform, produce
3. Precision	Independently perform the skill or produce the product, with accuracy, proportion, and exactness; at an expert level.	Achieve automatically, excel expertly, perform masterfully

4. Articulation	Modify the skill or produce the product to fit new situations; combine more than one skill in sequence with harmony and consistency.	Adapt, alter, customize, originate
5. Naturalization	Completion of one or more skills with ease and making the skill automatic with limited physical or mental exertion.	Naturally, perfectly

The performance levels in the table above can be described in terms that are easily recognizable.

Level	**Definition**	**Possible Verbs**
1. Imitate	Watch and imitate, doing it somewhat correctly, but good enough	Attempt, copy, duplicate, imitate, mimic
2. Manipulate	Perform correctly with instruction.	Complete, follow, play, perform, produce
3. Precision	Perform correctly without instruction; only one standard of performance – i.e. either correctly or timely	Achieve automatically, excel expertly, perform masterfully
4. Articulation	Perform correctly without instruction, two or more standards – i.e. both correctly and timely	Adapt, alter, customize, originate
5. Naturalization	Articulation without having to think about it; naturalized performance	Naturally, perfectly

In the electrical utility industry, examples of each of these levels include:

Imitation: A trainee watches a competent field transmission operator switch breakers at a substation according to an authorized and directed switching scheme, then attempts to demonstrate the steps the competent operator physically performed in a de-energized setting or a training simulation with less than the required level of correctness. Verbs

used to describe the demonstration of this level of psychomotor performance include: attempt, copy, imitate, duplicate, mimic.

Manipulation: A trainee switches breakers at a substation according to an authorized and directed switching scheme with instruction form a competent field transmission operator.

Precision: A trainee switches breakers correctly at a substation without instruction according to an authorized and directed switching scheme.

Articulation: A trainee switches breakers correctly at a substation without instruction in the time required by the situation according to an authorized and directed switching scheme.

Naturalization: A trainee switches breakers correctly at a substation without instruction in the time required by the situation without the need to reference the authorized and directed switching scheme.

Psychomotor skills for personnel that impact the reliability of the Bulk Electrical System have become more cognitive than psychomotor, but still involve some degree of physical performance. A example that is relatively common in the electric utility industry is navigating computer programs or systems to the correct screens.

Affective Performance

Performance that involves values and behaviors is less quantifiable, but still observable, and therefore can be trained and capability validated by a competent observer. Affective performance deals with the nature of performance that requires a person to either value something enough to focus their performance on achieving that value, or, at a lower level, exhibiting the behavior that should accomplish the outcome valued by the organization without personally adopting the value. Affective performance often requires an adherence to a value. The objective of training an individual to meet affective performance requirements is to produce the capability to perform according to some level of valuing a principle.

Affective performance is validated by an individual considered competent in achieving the desired attitudinal or value-driven outcome. For example, a task has an affective performance aspect when a tariff coordinator is contacted by a (bulk power) marketer that does not understand the Tariff rules that apply to their reservation request for transmission service, and that request is being denied. That Tariff Administrator responds to the marketer by: balancing the marketer's need to understand by instructing them, the time requirements of the scheduling system to get the transaction into the system in a timely manner, and the other demands on the Tariff Administrator's time that involves more users. This scenario involves more than one affective performance because it involves more than one value. The minimally acceptable level of affective response includes three parameters, not just one like the cognitive and psychomotor performance. It involves the value to help, the value to meet time demands of the system, and the value of balancing the Tariff Coordinator's work load against what they believe to be the performance that will continue their employment.

A Guide for Determining Performance Standards

One way to determine affective requirements is to identify levels of commitment to a value. Behaviors that achieve the desired outcome of an organization's value are indicative of a mindset that matches the organization's values. To identify performance that has an effective nature ask the question: "Does the behavior contribute to the desired outcome? Not, do the facts contribute to the desired outcome; not, do the actions taken contribute to the desired outcome; but does the behavior contribute to the desired outcome?"

Levels of affective functioning have been identified in the table below.

The following is adapted from: Krathwohl, D., Bloom, B., & Masia, B. (1956). *Taxonomy of educational objectives. Handbook II: Affective domain*. New York: David McKay.

Affective Domain		
Level	Definition	Example
Receiving	Being aware of or attending to something in the environment	Person would listen to a lecture or presentation about a structural model related to human behavior.
Responding	Showing some new behaviors as a result of experience	The individual would answer questions about the model or might rewrite lecture notes the next day.
Valuing	Showing some definite involvement or commitment	The individual might begin to think how education may be modified to take advantage of some of the concepts presented in the model and perhaps generate a set of lessons using some of the concepts presented.
Organization	Integrating a new value into one's general set of values, giving it some ranking among one's general priorities	This is the level at which a person would begin to make long-range commitments to arranging his or her instruction and assessment relative to the model.

Characterization by Value	Acting consistently with the new value	At this highest level, a person would be firmly committed to utilizing the model to develop, select, or arrange instruction and would become known for that action.

The table below has been adapted using examples relevant to the Bulk Electrical System

Affective Domain		
Level	Definition	Example
Receiving	Being aware of or attending to something in the environment	Reliability Coordinator sees a visual alarm on a new tool that monitors line flows. Doesn't acknowledge the alarm.
Responding	Showing some new behaviors as a result of experience	Reliability Coordinator sees a visual alarm on a new tool that monitors line flows. The RC acknowledges the alarm. The new tool is supposed to alarm when a line is overloaded, but the EMS is not alarming for that line, so the operator takes no other action.
Valuing	Showing some definite involvement or commitment	Reliability Coordinator sees a visual and acknowledges a visual alarm on a new tool that monitors line flows. The new tool is supposed to alarm when a line is overloaded, but the EMS is not alarming for that line. The RC checks line flow for the line on the EMS.

Organization	Integrating a new value into one's general set of values, giving it some ranking among one's general priorities	Reliability Coordinator sees and acknowledges a visual alarm on a new tool that monitors line flows. The new tool is supposed to alarm when a line is overloaded, but the EMS is not alarming for that line. The RC checks line flow for the line on the EMS, and no line overload is shown for that line. RC calls for IT to investigate the ICCP data for the line coming into the EMS to verify that the EMS is correct. IT says the ICCP link is working correctly. RC takes no further action.
Characterization by Value	Acting consistently with the new value	A Reliability Coordinator acknowledges an alarm on a new tool that monitors line flows. The new tool is supposed to alarm when a line is overloaded, but the EMS is not alarming for that line. The RC checks line flow for the line on the EMS, and no line overload is shown by the EMS for that line. The RC calls for IT to investigate the ICCP data for the line coming into the EMS to verify that the EMS is correct. IT says the ICCP link is working correctly. RC contacts neighboring RC to verify flow on the line.

Validation of a Performance Standard

Once the nature and level of performance is identified, the next step is to write the performance standard in such a way that it is either measurable or observable. For standards that are of a cognitive nature, the measures will be written in terms of quality, or if the task is done correctly according to some referenced criteria, such as a policy or rule. How often the task must be performed correctly may be expressed as a percent.

Measures for standards that are psychomotor in nature include;

- Quality addresses how well the work is performed and/or how accurate or how effective the final product is. Quality refers to accuracy, appearance, usefulness, or effectiveness.
- Quantity addresses how much work is produced. A quantity measure can be expressed as an error rate, such as number or percentage of errors allowable per unit of work, or as a general result to be achieved. When a quality or quantity standard is set, the Fully Successful standard should be high enough to be challenging but not so high that it is not really achievable.
- Timeliness addresses how quickly, when or by what date the work is produced. The most common error made in setting timeliness standards is to allow no margin for error. As with other standards, timeliness standards should be set realistically in view of other performance requirements and needs of the organization.
- Cost-Effectiveness addresses dollar savings. Standards that address cost-effectiveness should be based on specific resource levels (money, personnel, or time) that generally can be documented and measured against budgets. Cost-effectiveness standards may include such aspects of performance as maintaining or reducing unit costs, reducing the time it takes to produce a product or service, or reducing waste.
- Impact on customers or peers. Standards that address impact rely heavily on behaviors by the performer. Behaviors are observable, but must be described sufficiently so that the employee and management understand and agree on what is acceptable and not acceptable behavior. Describing the outcome of the task in terms of the response of other parties involved or impacted by the task is one way to observe successful performance.

The above bullet items are adapted from: U.S. Office of Personnel Management, "Developing Performance Standards"; http://www.opm.gov/perform/articles/118.asp

Attachment B

Cognitive Verbs

This is a list of verbs that should be used when writing the Action Element of a task statement when the performance is of a cognitive nature.

NOTE: Complexity of learning and therefore the objectives increases in this direction →

BEHAVIORAL VERBS FOR USE IN STATING COGNITIVE OBJECTIVES*

					Evaluation
					(making a judgment)
				Synthesis	appraise
				(creating)	assess
			Analysis	arrange	choose
			(reasoning)	assemble	compare
		Application	analyze	collect	conclude
		(using ideas)	appraise	combine	contrast
	Comprehension	apply	associate	compile	estimate
	(understanding)	construct	calculate	compose	evaluate
Knowledge	convert	compute	categorize	construct	judge
(recall, remember, recognize)	describe	demonstrate	compare	create	measure
cite	discuss	employ	contrast	design	rate
define	explain	estimate	criticize	develop	revise
identify	express	illustrate	debate	devise	score
label	give examples	interpret	determine	formulate	select
list	identify	operate	diagram	integrate	value
name	illustrate	practice	differentiate	manage	weigh
recall	interpret	prepare	discriminate	modify	
recite	locate	relate	distinguish	organize	
record	paraphrase	schedule	examine	plan	
relate	recognize	shop	experiment	prepare	
repeat	report	show	inspect	propose	
reproduce	restate	sketch	inventory	rearrange	
state	review	solve	outline	reorganize	
underline	tell		point out	revise	
	translate		question	rewrite	
			relate	set up	
			solve	write	
			test		

B. S. Bloom, et. al (1956). Taxonomy of educational objectives, Handbook I: Cognitive domain, New York: David McKay Company.

Psychomotor Verbs

A Guide for Determining Performance Standards

This is a list of verbs that should be used when writing the Action Element of a task statement when the performance is of a psychomotor nature:
NOTE: Complexity of performance and therefore the measure of the performance increases in this direction.

***Imitation**	***Manipulation**	***Precision**	***Articulation**	***Naturalization**
**Mimic	Handle	Achieve	Adapt	Perform perfectly
Copy	Maneuver	Accurately perform	Multi-task	Perform without thought
Shadow	Wield	Exactly perform	Customize	Effortless
Act	Complete	Correctly perform	Alter	Artfully
Duplicate	Perform		Master	Intuitively
Attempt	Operate			
Simulate	Produce			

* The categories of Psychomotor verbs are taken from: Dave, R. (1967). *Psychomotor domain*. Berlin: International Conference of Educational Testing.
** The verbs are provided by: Taylor, John P. (2007). "A Guide for Determining Task Performance Requirements".

Affective Verbs

This is a list of verbs that should be used when writing the Action Element of a task statement when the performance is of an affective nature:
NOTE: Complexity of performance and therefore the measure of the performance increases in this direction.

BEHAVIORAL VERBS FOR USE IN STATING AFFECTIVE OBJECTIVES*

				Characterization
				(internalizing a set of values)
			Organization	act upon
			(arrange values systematically)	advocate
		Valuing	adapt	defend
		(developing attitudes)	arrange	display
	Responding	adopt	classify	devote
	accept responsibility	assume responsibility	conceptualize	exemplify
Receiving	agree	behave according to	disclose	exhibit
(attending and becoming aware)	answer freely	choose	group	expose
accept	assist	commit	rank	influence
acknowledge	be interested	desire	reveal	justify behavior
be alert	show interest	exhibit loyalty		maintain
be aware	be willing	express		serve
notice	care fare	initiate		support
perceive	communicate	prefer		show consistent devotion to
tolerate	comply	seek		
	conform	show concern		
	consent	show continuing desire to		
	contribute	use resources to		
	cooperate			
	follow			
	obey			
	participate willingly			
	read voluntarily			
	respond			
	visit			

D. R. Krathwohl, B. S. Bloom & B. B. Masia (1964). Taxonomy of behavioral objectives, Handbook II. New York: David McKay Company