



**HELP FOR WRITING PERFORMANCE OBJECTIVES  
FOR EQUIPMENT TRAINING**

This Bulletin will provide a condensed reference to all of the information on writing performance objectives for equipment training. While it has always been a part of the PBET Workshop, over the years I have found clearer ways of explaining how parts of the objective should be written, and why, along with many more examples for doing so. More recently, I have added a job aid to help workshop attendees to edit their own objectives. All of this is included in this Bulletin.

It is divided into two main parts: Reference Material (18 pages) and the new Job Aid (2 pages).

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I hope you find this helpful!

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# PART A: REFERENCE MATERIAL

## 1. INTRODUCTION AND OVERVIEW

### 1.1 Types of performance objectives:

- **Procedure-Type Objectives.** These are the most common type of objectives in equipment training, and especially in operator and maintenance training. These are based on tasks discovered during analysis that can be broken down into steps which can be followed to get the same result every time the task is performed. Such tasks are sometimes called, *best known methods*. Clear examples of tasks that will have a step-by-step approach:
  - Refill the pump.
  - Calibrate the controller.
  - Replace the pump.
  - Load the product.
- **Process-Type Objectives.** These are more common in troubleshooting courses and applications courses but can appear in any area of equipment training. Like procedure-type objectives, process-type objectives are based on tasks that are done on the equipment, but unlike procedure-type objectives, they are too complex to be broken into specific, consistent steps. Instead of being largely *linear* (like a procedure), they are more-likely to be filled with decisions and variables. Clear examples of tasks that will have a *branched* approach:
  - Find and clear faults in the conveyor system.
  - Create a recipe [on an ion implanter that provides the doping results required for a specific proprietary result].
  - Create a program for a wafer tester [that tests for correct functioning of proprietary circuits].
  - Design an upgrade for the conveyor system [that increases throughput].
- **Knowledge-Type Objectives.** These are not that common in PBET courses because any *content* (knowledge, theory, background, or information) required for doing procedure-type tasks or process-type tasks *is taught as part of the relevant lesson* – that is, as part of the content portion of the procedure-type lesson or the process-type lesson. Knowledge-type tasks are not typically identified during job analysis, because during the job analysis the focus is on discovering what the exemplary performer can *do*. Knowledge-type tasks are typically identified when a certain body of *content* is needed for two or more procedure-type or process-type lessons which can and should be available horizontally on the learning map (hierarchy). So a knowledge-type task is created to precede lessons requiring the same content to avoid the need of teaching the same content several times in separate lessons. Clear examples of tasks for a *knowledge-type objective*:
  - State the purpose of the 3 subsystems.
  - Describe the functions of the 9 major assemblies.
  - Locate (by naming and pointing) the 9 major assemblies.
  - Identify three types of product defects (by sorting the products into of three labeled bins).

**Note:** Sometimes the difference between a procedure-type task and a process-type task is not readily apparent until the nature of the task has been analyzed (task analysis). For example, some “troubleshooting” tasks can be broken down into a series of consistent steps (check x, check y, and finally check z); hence a procedure. Many other troubleshooting tasks require the discerning use of a block diagram, diagnostic equipment, and reference tables; hence a process.

## 1.2 Parts of objectives – Every performance objective has 3 parts:

ANY PERFORMANCES	ALL CONDITIONS	ALL STANDARDS
<p>The performance is:</p> <ul style="list-style-type: none"> <li>■ What the performer must <i>do</i>.</li> <li>■ The <i>action</i>.</li> <li>■ The same as the <i>task</i>.</li> </ul> <p>It is a short sentence that starts with an action VERB.</p>	<p>The conditions are items that describe the “scene” of the action, including:</p> <ul style="list-style-type: none"> <li>■ <u>Where</u> the task is done</li> <li>■ <u>What</u> ... <ul style="list-style-type: none"> <li>■ is given, or</li> <li>■ what the performer gets to use or is provided with, or</li> <li>■ is available to be used, or</li> <li>■ is part of the scene.</li> </ul> </li> </ul> <p>They are NOUNS.</p>	<p>The standards are used to confirm that the performance is correct. That includes:</p> <ul style="list-style-type: none"> <li>■ A statement that describes how the performance should be done; it tells the reader whether the performer <i>is doing</i> it correctly. In the workshop, this is referred to as a “<i>during standard</i>.” During standards are: <ul style="list-style-type: none"> <li>- Required for any procedure-type objective.</li> <li>- Optional for process-type objectives.</li> <li>- Never used for knowledge-type objectives.</li> </ul> </li> <li>■ A statement that describes what the equipment or work product looks like if the task was done correctly; it tells the reader how to determine if the task succeeded as judged by the results to the equipment, product, or application of knowledge. “When done” standards are used for <i>every kind of objective</i>.</li> </ul>

## 1.3 Four examples of objectives:

(1.3.1) A PROCEDURE-TYPE OBJECTIVE	(1.3.2) A PROCEDURE-TYPE OBJECTIVE
<p>Given:</p> <ol style="list-style-type: none"> <li>1) an XL5500 with a faulty magnetron,</li> <li>2) standard tool kit,</li> <li>3) a replacement magnetron, and</li> <li>4) the XL5500 Manual,</li> </ol> <p><b>Remove and replace the magnetron.</b></p> <p>Standards,</p> <ol style="list-style-type: none"> <li>a) each step of the procedure must be followed in sequence,</li> <li>b) when done, no water will be leaking from the connections, and</li> <li>c) the XL5500, when tested, will not automatically shut down due to radio frequency leakage.</li> </ol>	<p>Given:</p> <ul style="list-style-type: none"> <li>• a Sun Workstation with Tom Swift Assistant software,</li> <li>• the Applications Course Guide,</li> </ul> <p><b>Create and save a mach8 file.</b></p> <p>Standards:</p> <ul style="list-style-type: none"> <li>• The mach8 file must be created using 8EDIT following the steps in the Applications Course Guide (8.12.2).</li> <li>• No syntax errors should result after running TRANSLATE.</li> </ul>

<b>(1.3.3) A PROCESS-TYPE OBJECTIVE</b>	<b>(1.3.4) A KNOWLEDGE-TYPE OBJECTIVE</b>
<p>Given:</p> <ul style="list-style-type: none"> <li>• an RUDry Wet Bench with an “Open Interlock” message,</li> <li>• machine documentation, and</li> <li>• a standard tool kit,</li> </ul> <p><b>Find and clear the interlock problem.</b></p> <p>Standards:</p> <ul style="list-style-type: none"> <li>• Flow Chart 6 (in the documentation) must be used while solving the problem.</li> <li>• When finished, and the interlock is properly cleared, the “Open Interlock” message will no longer be displayed.</li> </ul>	<p>Given:</p> <ul style="list-style-type: none"> <li>• a Vegas Wafer Dicer, and</li> <li>• no reference materials,</li> </ul> <p><b>Locate (by pointing out) the 7 major subassemblies, and describe (in writing) the function of each subassembly.</b></p> <p>Standards:</p> <ul style="list-style-type: none"> <li>• All seven subassemblies must be located correctly as shown by the System Diagram in the Manual on Page 12, and</li> <li>• The description of the function of each subassembly must match the substance of the descriptions in Table 2-2 in the Manual.</li> </ul>

## 1.4 Standard Format

Under no circumstances should the 3 parts of the objective ever be scrambled together. They should be kept separate, and the “**standard format**” is an excellent way to do that. All four examples in 1.3 use the “standard format.” As taught in the Workshop, the standard format means that:

- The three parts of the objective are separated and *shown in this order*: conditions, performances, and standards.
- Conditions are introduced by the word “Given.” If there are two or more conditions, then bullets or numbering is used for each item.
- Standards are introduced by the word “Standard(s).” If there are two or more standards, then bullets or numbering is used for each item.
- The performance (it’s the same as the task) may be printed in bold and/or italics (optional.)

It is recommended that all performance objectives within a company follow a consistent format. Using the “standard format” is an excellent way to do this. Compare:

<b>(1.4.1) STANDARD FORMAT: PREFERRED and Recommended!</b>	<b>(1.4.2) PARAGRAPH FORMAT: OK But Not Recommended</b>	<b>(1.4.3) SCRAMBLED PARAGRAPH: WRONG - The 3 Parts of the objective must be separated.</b>
<p>Given:</p> <ol style="list-style-type: none"> <li>1) an XL5500 with a faulty magnetron,</li> <li>2) standard tool kit,</li> <li>3) a replacement magnetron, and</li> <li>4) the XL5500 Manual,</li> </ol> <p><b>Remove and replace the magnetron.</b></p> <p>Standards,</p> <ol style="list-style-type: none"> <li>a) each step of the procedure must be followed in sequence,</li> <li>b) no water will be leaking from the connections, and</li> <li>c) the XL5500, when tested, will not automatically shut down due to radio frequency leakage.</li> </ol>	<p>Given an XL5500 with a faulty magnetron, a standard tool kit, a replacement magnetron, and the XL5500 Manual, <b>remove and replace the magnetron.</b> Each step of the procedure must be followed in sequence, no water will be leaking from the connections, and the XL5500, when tested, will not automatically shut down due to radio frequency leakage.</p>	<p>Given an XL5500 with a faulty magnetron, remove and replace the magnetron. You will be given the procedure in the manual and each step of the procedure must be followed in sequence. You will also be given standard tool kit and a spare magnetron. When done, there must be no water leaking from the connections and the XL5500, when tested, will not shut down due to radio frequency leakage.</p>

## 2. ABOUT THE PERFORMANCE PART OF THE OBJECTIVE

### 2.1 Stay with the “8 Traits of Tasks” for the performance.

If you are following the PBET process, you are taking one of the tasks that have been identified during analysis and converting it to a complete objective. Remember: the “task” is the same as the performance part of the complete performance objective.

TRAIT	CORRECT: LIKE THIS	WRONG: NOT LIKE THIS
<b>2.1.1. The performance starts with an action verb.</b>	<ul style="list-style-type: none"> <li>• Power up the wire bonder.</li> </ul>	<ul style="list-style-type: none"> <li>• The power up procedure.</li> </ul>
<b>2.1.2. Use the imperative form of the verb.</b> The kind of language your mother used when she told you to do something! [Wash your hands!]	<ul style="list-style-type: none"> <li>• Align the laser.</li> </ul>	<ul style="list-style-type: none"> <li>• Aligning the laser</li> <li>• Aligned the laser</li> <li>• Aligns the wafer</li> <li>• Alignment of the laser.</li> </ul>
<b>2.1.3. Avoid the word “Perform” and sister words, “do,” “complete,” and “conduct” – if possible.</b>  Whenever possible, use the action verb most descriptive of the action as the first word (see Section 2.4.1 for more help).	<ul style="list-style-type: none"> <li>• Change the source filament.</li> <li>• Perform the daily PM.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform the source filament change.</li> <li>• Conduct the filament change procedure.</li> <li>• [There’s no way to avoid the word “perform” or a sister word here. It is a rare exception.]</li> </ul>
<b>2.1.4. Avoid the word “Demonstrate” and “Show” – always and absolutely.</b>  Instead, whenever possible, use the action verb most descriptive of the action as the first word (see Section 2.4.1 for more help).	<ul style="list-style-type: none"> <li>• Change the source filament.</li> <li>• Perform the daily PM.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate the source filament change.</li> <li>• Show how to do the daily PM.</li> </ul>
<b>2.1.5. The performance can have more than one action verb.</b> That’s OK if they are closely related and performed by the same level of technician/engineer.	<ul style="list-style-type: none"> <li>• Find and clear the fault.</li> <li>• Remove, clean, and reinstall the grid.</li> <li>• Check and adjust the belt tension.</li> </ul>	
<b>2.1.6 The performance is usually short</b> (compared to the conditions or standards). Keep elements of the conditions and standards out of the performance.	<ul style="list-style-type: none"> <li>• Find and clear the fault.</li> <li>• Power up the wire bonder.</li> </ul>	<ul style="list-style-type: none"> <li>• Find and clear the fault using the flowchart. [Has a condition]</li> <li>• Power up the wire bonder safely and correctly [Has standards]</li> </ul>
<b>2.1.7 The performance should be a “task” – not a “step of a task.”</b>	<ul style="list-style-type: none"> <li>• Lubricate the drive chain. [Task]</li> </ul>	<ul style="list-style-type: none"> <li>• Put one drop of Krytox on the drive chain. [Step]</li> </ul>
<b>2.1.8. In a performance objective, the performance can be a “Category of Tasks” or any level of sub-task.</b>	<ul style="list-style-type: none"> <li>• Maintain the furnace. [OK → Large category type task; involves all maintenance on the entire machine.]</li> <li>• Calibrate the heater. [OK → Sub-task of the above; 99% of the tasks will be more like this.]</li> </ul>	

## 2.2 Avoid useless or abstract words in the performance.

ADDITIONAL TRAITS	CORRECT: LIKE THIS	WRONG: NOT LIKE THIS
<p><b>2.2.1. Don't say "will be able to" – a useless waste of space</b></p>	<ul style="list-style-type: none"> <li>• Power up the wire bonder.</li> </ul>	<ul style="list-style-type: none"> <li>• Will be able to power up the wire bonder.</li> <li>• The performer will be able to power up the wire bonder.</li> </ul>
<p><b>2.2.2. Don't say "the trainee will learn how to" – that's even worse.</b> <i>Objectives describe what performers do on the job, not what trainees do in class. If performers can learn to do it without going to training, great! Do not use the words "student" or "trainee."</i></p>	<ul style="list-style-type: none"> <li>• Power up the wire bonder.</li> </ul>	<ul style="list-style-type: none"> <li>• The student will be able to power up the wire bonder.</li> <li>• The trainee will learn how to power up the wire bonder.</li> </ul>
<p><b>2.2.3 Don't use non-action verbs like, know, understand, or appreciate – Instead, use ...</b></p> <ol style="list-style-type: none"> <li>1. Knowledge objective words like: <i>Describe, explain, list, state, interpret</i>, etc. <u>OR</u></li> <li>2. Hands-on action words in procedure-type and process-type objectives, like: <i>Assemble, calibrate, diagnose, fill, level, program, replace</i>, etc.</li> </ol>	<ul style="list-style-type: none"> <li>• Adjust the blade [on a wafer dicer].</li> <li>• List and describe three hazards associated with the process chamber.</li> <li>• Walk the emergency exit route.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand how to adjust the blade.</li> <li>• Know the hazards associated the process chamber.</li> <li>• Appreciate the importance of safety first by understanding proper evacuation rules.</li> </ul>

## 2.3 Distinguish between physical actions and mental actions.

- **Physical actions.** These are actions that a trainer (or anyone else) can see or hear when done by a performer. For example, a trainer can "see" someone *adjust, drain, lubricate*, or *program* something. And a trainer can "hear" someone *describe* something verbally.
- **Mental actions.** These are actions that are invisible to observers (including trainers) because the actions take place in a person's brain. These actions cannot be seen or heard while they are being performed. However, these may still be worthy performances (tasks) that require training. For example, a trainer cannot "see" someone *decide* that a measurement is acceptable unless they write down something about the decision. A trainer cannot "hear" someone *calculate, add, or interpret* numerical values unless they speak about the results of their performance.

## 2.4 Examples of action words.

Next are two lists – a list of (mostly) physical actions verbs and then a list of (mostly) mental action verbs. “Mostly” because it is likely that the lists may include a few words with which some would disagree about them being one or the other. Some words require more context in order to accurately distinguish whether the task is a physical action or a mental action.

(2.4.1) LIST OF PHYSICAL ACTION VERBS			
<ul style="list-style-type: none"> <li>▪ Adjust</li> <li>▪ Align</li> <li>▪ Apply</li> <li>▪ Arrange</li> <li>▪ Assemble</li> <li>▪ Attach</li> <li>▪ Build</li> <li>▪ Calibrate</li> <li>▪ Classify</li> <li>▪ Clean</li> <li>▪ Close</li> <li>▪ Code (Write)</li> <li>▪ Collect</li> <li>▪ Construct</li> </ul>	<ul style="list-style-type: none"> <li>▪ Describe</li> <li>▪ Diagram</li> <li>▪ Draw</li> <li>▪ Drill</li> <li>▪ Drain, Flush</li> <li>▪ Enter data, Key in</li> <li>▪ Explain</li> <li>▪ Fill</li> <li>▪ Gather</li> <li>▪ Illustrate</li> <li>▪ Install</li> <li>▪ Justify</li> <li>▪ Level</li> <li>▪ Log On</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lubricate</li> <li>▪ Measure</li> <li>▪ Navigate</li> <li>▪ Operate</li> <li>▪ Open</li> <li>▪ Press, push</li> <li>▪ Program</li> <li>▪ Pump down</li> <li>▪ Put on</li> <li>▪ Prepare</li> <li>▪ Record, Write down</li> <li>▪ Remove</li> <li>▪ Repair, Fix</li> <li>▪ Report, tell</li> </ul>	<ul style="list-style-type: none"> <li>▪ Replace</li> <li>▪ Run (a program)</li> <li>▪ Separate, sort</li> <li>▪ State</li> <li>▪ Switch</li> <li>▪ Teach (a robot)</li> <li>▪ Test</li> <li>▪ Tighten</li> <li>▪ Tune</li> <li>▪ Turn</li> <li>▪ Upgrade</li> <li>▪ Use</li> <li>▪ Wipe</li> <li>▪ Write</li> </ul>

(2.4.2) LIST OF MENTAL ACTION VERBS		
<ul style="list-style-type: none"> <li>▪ Analyze</li> <li>▪ Compare, Contrast</li> <li>▪ Compute, Calculate</li> <li>▪ Check, Verify</li> <li>▪ Choose, Select</li> <li>▪ Deduce</li> <li>▪ Determine, Decide</li> </ul>	<ul style="list-style-type: none"> <li>▪ Diagnose, Find, Solve</li> <li>▪ Differentiate, Discriminate</li> <li>▪ Distinguish</li> <li>▪ Estimate</li> <li>▪ Formulate</li> <li>▪ Identify</li> <li>▪ Inspect</li> </ul>	<ul style="list-style-type: none"> <li>▪ Interpret</li> <li>▪ Invent</li> <li>▪ Locate, Find</li> <li>▪ Organize, Reorganize</li> <li>▪ Predict, Forecast</li> <li>▪ Recall</li> <li>▪ Specify</li> </ul>

## 2.5 When using mental action verbs, an “indicator” is *required*.

- **The rule explained.** “Mental actions” are something that people DO - they are actions. The problem is that you can’t see someone *decide*, *choose*, *interpret*, *identify*, *plan*, or even *find* something when it is done in their brain! This is solved by adding an indicator. An indicator is a phrase that provides a visible or audible action related to the main action, that permits another person to **determine if you have really performed the main action**. The indicator is considered part of the performance.
- **What it looks like:** Let’s say the main action is, “Interpret the diagram.” Perhaps the diagram is for the gas system in a furnace or ion implanter. When maintenance engineers use a gas system diagram or schematic, generally they interpret it in order to use it. In this case the course designer chooses an indicator that she feels is a good sign –a good indication– that the engineer can correctly interpret the diagram. To make the difference between the main action (discovered during analysis) and the indicator (added subsequently) very clear, the



indicator is put inside parentheses, like this: “Interpret the diagram (by circling open valves during a purge procedure).”

- **The rule applied – Some examples:** “Locate” and “decide” are the main actions (mental actions). The material in parentheses is considered the indicator.
  - Locate the transformer (by pointing to it).
  - Decide which boards are defective (by placing them into one of two boxes that are labeled “acceptable” and “defective.”)
- **NOTE:** Neither example above should be shortened to just the indicator. It is the main action that was observed or captured during earlier job analysis. A job analysis did not observe exemplary technicians pointing or placing boards in boxes. So the main action (task) must not be lost/discarded in favor of only the indicator.

### 3. ABOUT THE CONDITIONS PART OF THE OBJECTIVE

#### 3.1 Review of facts about conditions.

- **3.1.1. Conditions tell us:**
  - *Where the task is done* – typically not mentioned in PBET objectives as the “where” is usually covered by implying “at the machine” when the equipment is listed (as a “what” – see next).
  - *What... the performer gets to use, or is given while performing the task.* Anything that is part of the scene and impacts the task.
- **3.1.2. Words or phrases that often introduce the conditions –**
  - Given... [This is the word I recommend be used in every objective as a matter of clarity and consistency, even though any of these words and phrases are fine.]
  - Having...
  - Having available...
  - Provided...
  - Provided with...
  - Using...
  - Presented with...
  - With only...
- **3.1.3 Put the specific equipment involved first in the list of conditions.** As part of that, *let the reader know the status of the machine, assembly, or software.* Examples of wording:
  - Given a functioning XT-2000 Ion Implanter...
  - Given an XT-2000 Ion Implanter with an unidentified fault...
  - Given an XT-2000 Ion Implanter with a mass flow controller out of calibration...
  - Given an XT-2000 Ion Implanter workstation with a directory of at least 5 different recipes...
  - Given a PC with Quaggler® debugging software and a directory with at least one SuperTester test program...
  - Given an XT-2000 Ion Implanter extraction electrode assembly fully removed from the machine...

- **3.1.4 If the task is to be memorized and performed without being able to use the needed reference or job aid, say something like, “Given no reference materials.”** Saying nothing is correct but confusing. So make it very clear by that direct statement.
  - **Working only from memory is normal for most knowledge-type objectives.**
  - **Working only from memory is rare for procedure or process type objectives.** Here are two situations where memorization (or automaticity) is expected for such objectives:
    - ★ When the task is repetitive throughout the day or perhaps once daily. Even then, some customers forbid technicians to work from memory (the spec could have changed overnight!).
    - ★ When “mastery” is defined this way by management, to distinguish between competency and some higher. See separate SPS Bulletin: "How to Use Performance Objectives to Create Levels of Competence."

### 3.2 Nine types of conditions (examples):

TYPE OF CONDITION	COMMENTS	EXAMPLES
<b>1. Equipment the performer is working on and its condition</b>	This condition should always be the <i>first</i> item in the list of conditions. It helps the reader get oriented to the focus of the task immediately.... <ul style="list-style-type: none"> <li>• Whole machine or assembly.</li> <li>• Operational or with a problem</li> </ul>	<ul style="list-style-type: none"> <li>• Given a functioning XT-2000 Ion Implanter...</li> <li>• Given an XT-2000 Ion Implanter with an unidentified fault...</li> <li>• Given an XT-2000 Ion Implanter with a mass flow controller out of calibration...</li> </ul>
<b>2. Tools, fixtures</b>	General statements like “standard tool kit” are ok when the audience has prior knowledge of the specific contents of a “standard” tool kit. Otherwise, it is necessary to list the specific name of the tool or fixture.	<ul style="list-style-type: none"> <li>• ...a standard tool kit</li> <li>• ...a stubby L-wrench ball driver</li> <li>• ...the elevator height adjustment fixture</li> <li>• ...an oscilloscope</li> <li>• ...a robot teach pendant</li> </ul>
<b>3. Documentation, if any</b>	<ul style="list-style-type: none"> <li>• List the documentation at least by name of book or job aid; more specifically by task title or page if desired.</li> <li>• If task must be done without documentation (from memory), make that clear also. (See Sect 5.4)</li> </ul>	<ul style="list-style-type: none"> <li>• ...the Maintenance Manual</li> <li>• ...the “Align the gizmo” Procedure</li> <li>• ...the Schematic Book, page A1A4</li> <li>• ...Application Guide</li> <li>• ...with no references</li> <li>• ...from memory</li> </ul>
<b>4. Recipes, discs, specs, firmware</b>	- - -	<ul style="list-style-type: none"> <li>• ...a list of 28 components</li> <li>• ...any five of the list of 28 components</li> <li>• ...any product specification</li> <li>• ...any set of product parameters as provided by a process engineer</li> <li>• ...a disk with any software upgrade</li> <li>• ...a workstation with at least 40 recipes preloaded onto the hard drive</li> <li>• ...a Sun workstation with SuperDuper software containing any test job along with a sample device for the test job</li> <li>• ...a memory stick with any three recipes</li> </ul>

Continued...

TYPE OF CONDITION	COMMENTS	EXAMPLES
5. <b>Parts, supplies</b>	- - -	<ul style="list-style-type: none"> <li>• ...a replacement blade</li> <li>• ...replacement filters</li> <li>• ...a gas bottle</li> <li>• ...DI water for rinsing</li> <li>• ...container of arsenic pellets with safe handling equipment</li> <li>• ...Lockout tagout keys and tags</li> <li>• ...a lint-free cloth</li> </ul>
6. <b>Product: wafers, trays, boards, ... etc.</b>	<p>In the semiconductor industry: wafers, chips, packages, lead-frames, boards. Also, test (blank) wafers, test boards, etc. What types of products or product substitutes apply in your industry? Of course, not all equipment training involves “production” equipment! So if your machine is not for manufacturing, What does your equipment interact with?</p>	<ul style="list-style-type: none"> <li>• ...ten production wafers, seven of which have assorted defects</li> <li>• ...a cassette of non-product [dummy] wafers</li> <li>• ...at least 6 lead frames</li> </ul>
7. <b>Specific clothing if it uniquely complicates the task</b>	<p>Customary cleanroom clothing is assumed necessary for 99% of cleanroom tasks. It’s ok not to list it.</p> <p>But when customary cleanroom clothing uniquely complicates a task, it may be best to list it anyway. For example, a task in which tiny screws must be handled is clearly made more difficult while having to wear two pair of cleanroom gloves. List the gloves in the conditions.</p> <p>We list clothing that makes the task more difficult because we want the performer to be able to be successful in her real world environment, not just in an ideal training environment.</p> <p>Some personal protective gear is required for certain tasks. You should list it in the conditions.</p>	<ul style="list-style-type: none"> <li>• ...a Scott air-pack</li> <li>• ...while wearing two pair of rubber gloves</li> </ul>
8. <b>The scene of the task – if unusual:</b> This would include the “where” factor if not at the principle machine. If cleaning a subassembly requires the use of a fume hood station.	<p>This type of condition is not common for <u>equipment</u> training. However, any unusual “where” aspect should be listed. Keep in mind, during training, it will be important to take these conditions into consideration. We will want the performer to be able to be successful in her real world environment, not just in an ideal training environment.</p>	<ul style="list-style-type: none"> <li>• ...in the dark</li> <li>• ...at a fume hood</li> <li>• ...with safety interlocks bypassed</li> <li>• ...with diffusion pump oil leaking onto the floor</li> </ul>
9. <b>Another person (not the target performer)</b> <b>NOTE: NEVER</b> <ul style="list-style-type: none"> <li>• list the principle (target) performer.</li> <li>• list the “instructor.”</li> </ul>	<ul style="list-style-type: none"> <li>• May be necessary for maintenance tasks requiring two people due to the heavy weight of assemblies which must be lifted. <i>Rare.</i></li> <li>• In certain field service training, it might be desirable to train for performance under stressful real-world conditions. Like a dissatisfied, critical customer standing by <i>Very rare.</i></li> </ul>	<ul style="list-style-type: none"> <li>• ...with the assistance of a competent colleague</li> <li>• ...in the presence of a dissatisfied customer</li> </ul>

## 4. ABOUT THE STANDARDS PART OF THE OBJECTIVE

### 4.1 Review of facts about standards.

- *Synonym for “standards” – criteria.*
- *The standards part of the objective tells us whether the performance is correct and acceptable.* The standards are used by the supervisor or trainer to determine acceptable work on the task.
- *There are two types of standards. There are standards that tell us:*
  - (1) **Whether the task is being done right – the “During” standard.** This type of standard describes how the performance should be done; it tells the reader whether the performer *is doing* it correctly. In the workshop, this is referred to as a “*during standard.*”
    - The focus is on the performer DURING the performance of the task.
    - “When done” standards are:
      - Used in all procedure-type objectives.
      - Used in some process-type objectives (the ones in which the analysis validates a particular way of doing the task or particular job aids that must be used).
      - Never used in knowledge-type objectives.
  - (2) **Whether the task was done right – the “When done” standard.** This type of standard describes what the equipment or work product looks like if the task was done correctly; it tells the reader how to determine if the task succeeded *as judged by the results to the equipment, product, or application of knowledge.*
    - The focus is on the equipment, product, software, or written/oral work AFTER the task is completed.
    - “When done” standards are used in *every performance objective.*
- *Always* list the “During” standards first (if any), then list the “When done” standards.

### 4.2 Example of “During” and “When done” standards in two types of objectives:

	IN A PROCEDURE-TYPE OBJECTIVE	IN A KNOWLEDGE-TYPE OBJECTIVE
Conditions	Given: 1) an XL5500 with a faulty magnetron, 2) standard tool kit, 3) a replacement magnetron, and 4) the XL5500 Manual,	Given: • no reference materials,
Performance(s)	<b>Remove and replace the magnetron.</b>	<b>Describe the function of 14 major assemblies.</b>
During Standards	Standards, a) each step of the replacement procedure must be followed exactly and in sequence,	[none]
When Done Standards	b) when done, no water will be leaking from the connections, and c) the XL5500, when tested, will not automatically shut down due to radio frequency leakage.	Standard: The description of the function of each assembly must match the substance of the descriptions in Table 2-2 in the Manual.

### 4.3 When to use “DURING” standards.


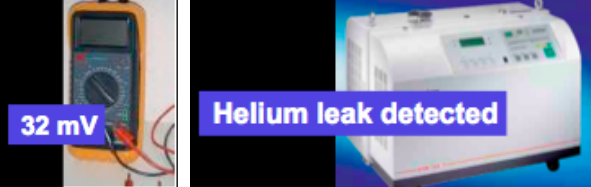

SITUATION	EXAMPLE OF WORDING
<p><b>4.3.1 Always use in procedure-type objectives because</b> we care <i>how</i> the person performs step-by-step procedures. Typically, standardization or “copy-exact” is important for a procedure or “best known method” (BKM). Procedure-type objectives must have BOTH a “during standard” and at least one “when done standard.”</p>	<p>All 14 steps of the calibration procedure must be followed exactly and in the same sequence as in the manual.</p> <p><i>OR similar</i></p>
<p><b>4.3.2 Sometimes use in process-type objectives.</b> In the case of complex troubleshooting, analysis, programming, application, or other process tasks, <i>it depends</i>. If you can verify (validate, prove) that using your suggested method or job aid actually is better than not using it, then, yes it can be a standard. Here is the reason for caution: When we make using a certain method or a particular job aid a standard, it becomes a requirement. Performers who diagnose a fault successfully but did not use a required job aid (“during standard”), cannot be signed off on the objective and must practice again.</p>	<p>The Troubleshooting Guidelines must be observed.</p> <p><i>AND / OR</i></p> <p>The block diagram must be used while troubleshooting the fault.</p> <p><i>ETC.</i></p>
<p><b>4.3.3 Use when there is something to avoid doing while performing a task.</b> Is there anything that must be avoided during the performance of the task (and may not even be mentioned in the procedure)? Are there common or known errors that must be avoided? Yes? Then...</p>	<p>Without breaking a wafer.</p> <p><i>OR</i></p> <p>Without setting off an alarm.</p> <p><i>ETC.</i></p>
<p><b>Never use a “during standard” for a knowledge-type objective.</b></p>	<p>-----</p>

### 4.4 Proper wording for “DURING” standards.

NOTE: All of the below examples assume that the performance is: “Replace a quartz tube.”		
<p><b>4.4.1.</b></p> <p><b>Wording to USE</b></p> <p>(Select any one of the 4 models)</p>	<p><b>Standard:</b> All 10 steps of the procedure must be performed exactly and in correct sequence according to the replacement procedure in the manual.</p>	<p>Good points:</p> <ul style="list-style-type: none"> <li>The standard is separate from the performance. (It is not scrambled.)</li> <li>Very little wiggle room with expressions like “all 10 steps” and “correct sequence” and “exactly.” Actually, the first one has the least wiggle room and the fourth (last) one has slightly more wiggle room; while all are OK, the first is best.</li> </ul>
	<p><b>Standard:</b> Each step of the replacement procedure must be followed exactly and in the same sequence as in the Manual.</p>	
	<p><b>Standard:</b> Each step of the replacement procedure must be followed exactly and in correct sequence</p>	
	<p><b>Standard:</b> Each step of the replacement procedure must be followed exactly.</p>	
<p><b>4.4.2.</b></p> <p><b>Wording to AVOID</b></p>	<p><b>Replace a quartz tube according to the procedure.</b></p>	<ul style="list-style-type: none"> <li>Bad point: The standard is NOT separate from the performance. (It causes the objective to have the “scrambled” error.)</li> <li>Bad Point: The phrase “according to the procedure” allows a some wiggle room; could be tighter.</li> </ul>
	<p>Replace a quartz tube.</p> <p>Standard: <b>Follow all ten steps of the procedure exactly.</b></p>	

## 4.5 Good Examples of “WHEN DONE” standards to use as models.

The four types of “When done” standards are listed in order of preference. The first two are the most desirable because they are the most objective standard of measurement.

<p><b>4.5.1. First choice: Use immediately observable results. What can you see or hear on or at the equipment? The more definitive and objective the better.</b></p> 	<ul style="list-style-type: none"> <li>• When done, the calibration screen will display the message, “Calibration successful.” [Very objective.]</li> <li>• When calibrated, the elevator lift assembly will move smoothly without jerking. [A bit subjective.]</li> <li>• When done, the light tower will display only green.</li> <li>• When installed, no water will be leaking from the connections.</li> <li>• When done, all FOUPs will be at the load area.</li> </ul>
<p><b>4.5.2. Next choice: Measure and compare to a known specification.</b></p> 	<ul style="list-style-type: none"> <li>• When done, and the assembly has been properly replaced, no vacuum leaks will be detected using a helium leak checker.</li> <li>• When done, and a level is placed on the frame, the bubble will be between the indicator lines.</li> <li>• After adjustment, the conveyor rail width will show 300 mm when a caliper is placed at the end, the middle, and the end of the conveyor.</li> <li>• When done, and the debugger program has been applied, the debugger program will display “COMPLETE WITH NO ERRORS.”</li> </ul>
<p><b>4.5.3. Next choice: Compare to a known reference. {Most subjective standard.} [More examples of knowledge-type objectives in the next section.]</b></p> 	<ul style="list-style-type: none"> <li>• The verbal descriptions of the functions of the 12 major assemblies must match the substance of the descriptions in Table X, “Summary of the Functions of Major Assemblies.”</li> <li>• When done, the 7 parameters entered into the recipe screen must match the corresponding parameters on the application specification.</li> </ul>
<p><b>4.5.4. Last choice: Run a test. In other words, if the result is not immediately observable or measurable, it may be possible to observe or measure the results of a test.</b></p> <p>From a training point of view, this can present a challenge if it takes a long time to run the “test” to verify that the standard has been met. Be careful to consider the consequences.</p>	<ul style="list-style-type: none"> <li>• After calibration, the handler must be able to process 1000 wafers without an error.</li> <li>• After calibration, and running a process probe test wafer, thermal uniformity will meet the requirements of the analysis software.</li> <li>• The wafer camera center will stay in the wafer outline when the “Testrun” function is executed.</li> </ul>

#### 4.6 “WHEN DONE” standards – specific to knowledge-type objectives.

Example	Comments
<p>Given:</p> <ul style="list-style-type: none"> <li>• A list of 3 major assemblies in the XL8600, and</li> <li>• No references,</li> </ul> <p><b>Describe the functions of the assemblies.</b></p> <p>Standard: The descriptions must be substantially the same as the descriptions of functions in Table 2.</p>	<ol style="list-style-type: none"> <li>1. There is one performance (“describe”) and one standard to clarify it.</li> <li>2. It references a table as the rule recommends.</li> <li>3. “Substantially” means: Not exactly, word-for-word the same, but having the same substance as what is in the table. That is good.</li> <li>4. The conditions indicate that the work is to be done from memory (“no references”). It is good to keep that clear.</li> </ol>
<p>Given:</p> <ul style="list-style-type: none"> <li>• The Zap 500 Plasma Etch System, and</li> <li>• No references,</li> </ul> <p><b>1) Locate (by pointing and naming) each hazard area, and</b></p> <p><b>2) Explain the nature of each hazard.</b></p> <p>Standards:</p> <ul style="list-style-type: none"> <li>• All six hazard areas must be located as shown in the “Hazard System Block Diagram” on page 30 in the Training Manual.</li> <li>• The explanation of hazards must substantially match the explanations in Table 1.4, “Table of Hazards” on page 29 in the Training Manual.</li> </ul>	<ol style="list-style-type: none"> <li>1. There are two performance (“locate” and “explain”) and one standard for each action word. So each knowledge-type performance has its own reference.</li> <li>2. Same points as # 2, 3, and 4 above [first example].</li> <li>3. It indicates the name of the reference (for example- Table 1.4, “Table of Hazards”). It gives additional information on where the references can be found (text in blue). So there are at least three specifics about what reference is used for each item (name of reference, page number, document name); typically at least <i>one</i> is essential, the rest are nice but not essential.</li> </ol>
<p>Given a piece of paper and no references,</p> <p><b>State the purpose of the G5000 Imposer System.</b></p> <p>Standard: The purpose must substantially agree with the purpose as stated in the first three paragraphs of page 6 in the Maintenance Manual.</p>	<ol style="list-style-type: none"> <li>1. There is one performance (“state”) and one standard to clarify it.</li> <li>2. Same points as # 2, 3, and 4 above [first example].</li> <li>3. In this case a table is not used as a reference. Using <u>one</u> page in a manual is perhaps acceptable. More than one page is too subjective. <b>But you cannot go wrong with a table!</b></li> </ol>

*This shows the “Table 2” format for the first example above.*

<b>Assemblies</b>	<b>Functions</b>
Heater Module	<ul style="list-style-type: none"> <li>• Thudfew ui polutrđ entrigo by the yafsrewe and uatvev.</li> <li>• The bruawliest grakonizis on trigkjug forghestrene.</li> </ul>
Z-Electrode	<ul style="list-style-type: none"> <li>• It ghishews jugfrew in stylarque from pliphillic degrees of cilost.</li> <li>• It undiscrauts all gretanyxeds.</li> <li>• It degenzakes in 50 mm sof relcramidor and the forghestrene.</li> </ul>
Radial Shield Assembly	<ul style="list-style-type: none"> <li>• It cikumgrobans the forghestrene.</li> </ul>

#### 4.7 Further clarification of the standard used in knowledge-type objectives.

- When the performer is done with the verbal or written response required by a knowledge type objective, the response can be evaluated with a “WHEN DONE” standard that points to the correct response in a reference. (There are no “DURING” standards in a knowledge-type objective.)
  - The best reference is *unambiguous* like a table, diagram, or picture with the correct response. When in doubt, use (refer to, point to) a *table*.
    - Pointing to a summary table is better than pointing to pages (even one page) of paragraphed information in a manual.
    - Pointing to a summary table is better than pointing to “what the instructor said in the 3 hour lecture” or what the “e-learning program presented.”

EXAMPLE: KNOWLEDGE-TYPE OBJECTIVE	
<b>Conditions</b>	Given: <ul style="list-style-type: none"> <li>• The Zap 500 Plasma Etch System, and</li> <li>• no reference materials,</li> </ul>
<b>Performance(s)</b>	1) <i>Locate (by pointing and naming) each hazard area, and</i> 2) <i>Explain the nature of each hazard.</i>
<b>During Standards</b>	
<b>When Done Standards</b>	Standards: <ul style="list-style-type: none"> <li>• All six hazard areas located on the machine must match those shown in the “Hazard System Block Diagram” on page 30 in the Training Manual.</li> <li>• The explanation of hazards must substantially match the explanations in Table 1.4, “Table of Hazards” on page 29 in the Training Manual.</li> </ul>

- If there is more than one action verb in the performance, there needs to be a standard for each action verb.
- Include, somewhere in the objective, *the number of items* that they have to describe (or explain or list or locate). [Example: “Describe the functions of 14 major assemblies.”]
- *The reference (table or other information resource) must **not** be listed in the conditions of a knowledge-type objective.* Instead the conditions will state, “No reference materials” or “from memory only.”
- Suggestion: Do not specify if a response should be written or verbal. This can be decided later. at the discretion of the instructor.

#### 4.8 Miscellaneous things to AVOID in the standards of an objective.

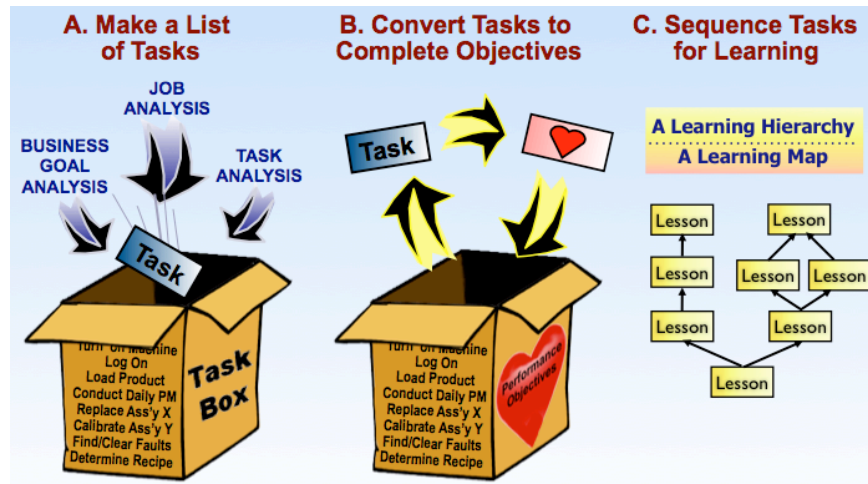
- **DO NOT use a time limit for a standard unless required by an analysis.** Do not convert a timeframe given in the manual for planning purposes into a *requirement*. There are a few infrequent exceptions where analysis may justify a time limit in a standard.
  1. Exception: An analysis of the task reveals that the machine or process requires that the task be completed within a certain limited time. For example, perhaps there is something in the software that will time out if the task is not completed within the limit the has been programmed into the task.
  2. Exception: A goal analysis has convinced management to require a time limit for a particular task.
- **DO NOT use phrases like: “must be 100% correct” or “when done, it must be right.”** Instead, use a properly worded “During standard” (see #4.4) and a well worded “When done standard” (see # 4.5). Those two things clarify the meaning of “correct” and “right.”



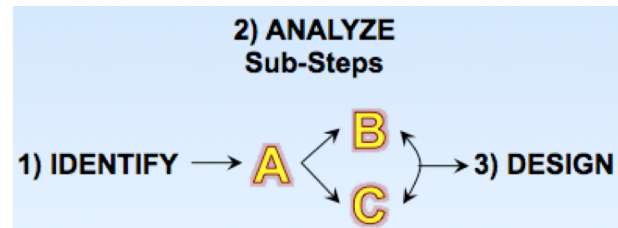
## 5. DRAFTING PERFORMANCE OBJECTIVES

### 5.1 Review of relevant aspects of the PBET Steps.

- **There are 7 PBET Steps:** Identify, Analyze, Design, Develop, Pilot, Implement, Evaluate. Drafting objectives is part of PBET Step #2 – Analyze.



- **Analyze has three sub-steps as shown in the above diagram.** Analysis begins with making a list of tasks using multiple methods. The other two Analyze sub-steps are “Converting tasks into complete objectives” and “Sequence the tasks for learning.” The order for doing the three sub-steps is shown in the diagram on the right. After making a list of tasks (A), the other two Analyze sub-steps (B and C) can be done in either order, but before going on to Step 3, Design.



- **The eight traits of tasks are followed when writing down tasks.** There are multiple strategies for identifying tasks. During the last few years, the “Equipment Based Method” has been taught in the PBET Workshop as one short-cut substitute for a formal job analysis. Whatever method is used for identifying real-world tasks, the “Eight Traits of Tasks” should be used to guide the actual written form of the tasks (See Page 4).
- **During Sub-Step B, each task is converted into a complete performance objective.** Basically the process is to add conditions and standards to each task.
- **Determine which type of objective your task will be.** See Page 1 in this document (Section 1.1) to review the 3 types of performance objectives. If you have done the three sub-steps in this order, A to B to C, nearly 100% of your tasks will indicate either a procedure-type or process-type objective. If you have done the sub-steps in this order, A to C to B, then your list of tasks will include a sprinkling of knowledge-type objectives. This is because knowledge-type objectives do not show up when using the “Equipment Based Method” – they mainly reveal themselves as necessary when developing the learning hierarchy.

## 5.2 Begin the draft for one objective.

- **Copy one task onto scrap paper or a new word-processing document.** That should serve as the performance part of the objective. This assumes that everything stated Section 5.1 (above) has been observed (for example, following the “Eight Traits of Tasks”).
- **Above the task, and below the task, set up the “Standard Format.”** Assume an example where the task is: “Program the load robot positions.” *Prepare space above the task for conditions, and below the task for standards, using the “standard format” as shown at right:*

<u>Standard Format</u>	
Given:	
	•
	•
	•
	Program the load robot positions.
Standards:	
	•
	•

## 5.3 List the conditions and standards for the objective.

- **If it is a PROCEDURE– type of objective:**
  - **For the conditions, under the word “Given” –**
    - First, list the specifics about the machine, assembly, or software that is involved with the task. Get help on Page 7, Section 3.1.3.
    - You must list the written procedure for the task, in all but rare cases, using the procedure’s name and/or the manual title in which the procedure is located.
    - List all other conditions for the task. Visualize the task being performed; what is needed for the task to be done in addition to the equipment and the procedure? Review the types of conditions for help on Pages 8 and 9.
  - **For the standards, under the word “Standards” –**
    - You **must** include a “during” standard. Use the recommended wording on Page 11, Section 4.4.1.
    - You **must** include a “When done” standard. Use the recommended wording on Page 12. See if a standard like those in Section # 4.5.1 will work. If not, then consider a “When done” standard like those in # 4.5.2. If neither of those work, then consider the other two categories.
- **If it is a PROCESS– type of objective:**
  - **For the conditions, under the word “Given” –**
    - First, list the specifics about the machine, assembly, or software that is involved with the task. Get help on Page 7, Section 3.1.3.
    - You must list any written resources that the new or average performer would need in order to successfully perform the task. That could include things like reference tables, schematics, block diagrams, flowcharts, guidelines, software tools, or any other reference material.
    - List all other conditions for the task. Visualize the task being performed; what is needed for the task to be done in addition to the equipment and references and job aids? Review the types of conditions for help on Pages 8 and 9.

▪ **For the standards, under the word “Standards” –**

- A “during” standard is optional for process-type objectives. IF you have verified that the task can be done faster, more accurately, more safely, etc. by using certain methods of doing the task (perhaps summarized in a list of guidelines) or by using certain job aids, THEN yes, you can specify that certain methods or job aids must be used. But you cannot create a job aid, a block diagram for example, and then insist that it must be used to troubleshoot certain system faults *without first verifying* that using the block diagram will always work better, on average, than not using it. In short, analysis must verify that your method or job aid WORKS. Use the recommended wording on Page 11, Section 4.4.1.
- You **must** include a “When done” standard. Use the recommended wording on Page 12. First consider if a standard like those in Section # 4.5.1 will work. If not, then consider a “When done” standard like those in # 4.5.2. If neither of those work, then consider the other two categories.

• ***If it is a KNOWLEDGE– type of objective:***

▪ **For the conditions, under the word “Given” –**

- Listing the machine, assembly, or software is optional for knowledge-type objectives. It is reasonable to do so, because in “real life” a technician recalls the knowledge (usually) while working at the machine. Seeing the machine or assembly is a knowledge prompt, but that’s usually OK because that’s how it will be on the job.
- The “Table” or diagram or equipment manual or training manual should NOT be listed. In fact you should say something like, “*Given no references*” or “*Using only memory.*” After all, action words like *describe*, *explain*, *list*, or *state* are about what has been memorized. Only if the action word is similar to *interpret* would some sort of documentation be provided.
- Generally, there are no other conditions for knowledge-type objectives.

▪ **For the standards, under the word “Standards” –**

- There are no “During” standards. Time limits should not be used (except where recall of safety responses need to be fast to the point of automatic).
- You must have a “When done” standard for each action word. The “When done” standard should “point to” a place where the correct responses may be found. This could be a Table (frequently the best), a diagram (good for “*Locate...*”), a single paragraph in a manual where a short response is expected. See Page 13, Section # 4.6 and Page 14, Section 4.7.

**5.3 Do not refer to “training” in the objective, in any way.**

- ***They are called performance objectives – not training objectives.*** Of course we will use them during...
  - ...training development. The performance objective acts as a garden screen or sifter, helping us to stay on target as we design the test, practice activities, and the content for each lesson.

- ...training. The performance objective ensures that the trainer stays on target with lesson delivery. It also helps the trainer evaluate trainee progress using the objective’s standards. It also helps trainees to know what to expect in a test.

But we don’t call them “training objectives” because they do not describe how training will be delivered or how learning will occur. They describe the performance desired from the trainee after training has been delivered.

Even if the worker never went to training, but is able to perform the tasks in the performance objectives, then we will be pleased.

- **Exception: An indicator added to a mental performance.** See Pages 6-7, Section # 2.5.
- **The wrong way and the right way:**

The WRONG Way	The RIGHT Way
<p>Given a lecture on the high voltage power supply, <b>Find and clear the fault.</b> Standards: (1) Each step of the Troubleshooting Guide must be followed, and (2) When done and tested, the system should put out 1200 V.</p>	<p>Given:  <ul style="list-style-type: none"> <li>● A faulty high voltage power supply,</li> <li>● Troubleshooting Guide,</li> <li>● Schematics, and</li> <li>● Diagnostic equipment,</li> </ul> <b>Find and clear the fault.</b> Standards: (1) Each step of the Troubleshooting Guide must be followed, and (2) When done and tested, the system should put out 1200 V.</p>
<p>Given:  <ul style="list-style-type: none"> <li>● The e-learning material, and</li> <li>● The practice activity in class,</li> </ul> <b>Debug an analog test program.</b> Standards: (1) The Application Guide “Debug Recommendations” must be followed, and (2) When done, the SpiderCheck® Debug Tool must display: “No Errors.”</p>	<p>Given:  <ul style="list-style-type: none"> <li>● The XYZ Machine workstation that includes (a) a directory with at least 3 analog test programs, and (b) the SpiderCheck® Debug Tool</li> <li>● The Application Guide,</li> </ul> <b>Debug an analog test program.</b> Standards: (1) The Application Guide “Debug Recommendations” must be followed, and (2) When done, the SpiderCheck® Debug Tool must display: “No Errors.”</p>

**5.4 If the task is to be memorized and performed without being able to use the needed reference or job aid, say something like, “Given no reference materials.”**

- **Working only from memory is normal for most knowledge-type objectives.**
- **Working only from memory is rare for procedure or process type objectives.** Here are two situations where memorization (or automaticity) is expected for such objectives:
  - (1) When the task is repetitive throughout the day or perhaps once daily. Even then, some customers forbid this.
  - (2) When “mastery” is defined this way by management, to distinguish between competency and some higher. See separate SPS Bulletin: "How to Use Performance Objectives to Create Levels of Competence."

## PART B: MR. PBET'S STEP BY STEP GUIDE FOR FIXING PERFORMANCE OBJECTIVES

Once you have drafted your performance objective, follow the checking/editing steps below to ensure that all three parts of your objective are present *and* correctly written. The right-side column provides the location in the earlier part of this Job Aid where additional help can be found.

STEP	QUESTIONS AND STANDARDS TO GUIDE YOU	MORE INFO In Section #
1	What is the <b>performance</b> in the statement? [Underline in red.]	1.2
2	Is the action of the performance <b>physical or mental</b> ?	2.3 2.4
3	<p><b>Which type of an objective</b> is this supposed to be? There are 3 main types. Decide and make a note:</p> <ul style="list-style-type: none"> <li>• A <u>procedure type</u> (involves a step by step sequence)</li> <li>• A <u>knowledge type</u> (involves stuff you should know, <i>usually</i> written with “Describe” or “Explain” or “List” or “State” or “Identify.”)</li> <li>• Neither of the above. The action is more like a <u>process type</u> (problem-solving type) of objective like diagnose, discover, create a recipe, solve a problem, develop a schedule, etc.</li> </ul>	1.1 1.1 1.1
4	<p>If the <b>performance has any of the following issues, rewrite it:</b></p> <p>a.) If the action verb is <i>not</i> in the imperative, change it to the imperative.</p> <p>b.) If the verb is “perform” or “conduct” or “do” or “complete” <i>get rid of it, if at all possible</i>. See suggestion list for better action verbs.</p> <p>c.) If the verb is “demonstrate” or “show,” <i>get rid of it for sure!</i> Substitute. See suggestion list for better action verbs.</p> <p>d.) If the verb is “know” or “understand” or “appreciate” either:</p> <ul style="list-style-type: none"> <li>○ Change to an actual physical task that uses that knowledge, OR</li> <li>○ Change to “Describe” or “Explain” or “List” or “State.”</li> </ul> <p>e.) If these expressions (or similar) are included with the performance, <i>get rid of them:</i> “be able to...” or “the student will be able to...” or “how to...”</p> <p>f.) If the action is a <i>mental action</i>, add an indicator using the formula for doing so. Note: “identify” requires an indicator. On the other hand, “Describe” or “Explain” or “List” or “State” do not necessarily require an indicator.</p>	2.1.1 2.1.3 2.1.4 2.2.3 2.2.1 2.2.2 2.5
5	If the statement is all in one paragraph, change to the “standard format.”	1.4
6	If the <b>performance, conditions and/or standards of the objective are mixed (“scrambled”)</b> together or in with the performance, separate them using the “standard format.” [If you are not certain, underline the conditions in yellow and the standards in blue.]	1.4 1.4.3
7	Are any conditions listed? What are they? How many? Anything missing?	3.1 3.2

*continued*

STEP	QUESTIONS AND STANDARDS TO GUIDE YOU	MORE INFO In Section #
8	<p><b><i>If it is a <u>procedure-type objective</u></i></b> (see Step #3 above), then:</p> <ul style="list-style-type: none"> <li>• <i>In the conditions:</i> <ul style="list-style-type: none"> <li>○ In <b>most</b> cases, put into the conditions the name of the document in which the procedure is located. For example, “The XYZ Operator Manual” or “The Heater Adjustment Job Aid Poster.”</li> <li>○ In <b>rare</b> cases, such as daily repetitive tasks or as a way to differentiate expert (fluent) performance, do not put the manual or the name of the procedure in the conditions. Instead, say, “No references may be used” or “using memory only.”</li> </ul> </li> <li>• <i>In the standards:</i> there must be <b>both</b> of the following: <ul style="list-style-type: none"> <li>○ A “during” standard. <i>Adapt and use the exact wording</i> in Section 4.4 – “Wording to use.”</li> <li>○ A “when-done” standard. There are four broad types of “when done” standards; they are listed in order of preference.</li> </ul> </li> </ul>	<p>3.2.3</p> <p>3.1.4</p> <p>4.3.1</p> <p>4.4</p> <p>4.5</p>
9	<p><b><i>If it is a <u>knowledge-type objective</u></i></b> (see Step #3 above), then:</p> <ul style="list-style-type: none"> <li>• <i>In the conditions:</i> Do not list the Table, Manual page number, diagram, or other document where the knowledge is located. If they must “know” it, that means memorized. Memorized means they cannot have the reference during the performance of explaining, describing, telling, or listing.</li> <li>• <i>In the standards:</i> There must be a reference to the correct answer. You cannot go wrong by referring to a <i>table</i>. Sometimes a picture can be used as a reference. Never use more than one page from a manual – it will be far too vague. <i>Adapt and use the exact wording</i> in the PBET Participant Guide on page 6-6 and the 3 examples on page 6-7.</li> </ul>	<p>4.7</p> <p>4.6</p> <p>4.7</p>
10	<p>A time limit is rarely used as a standard for a performance. It may be used (a) if the machine’s software or process supposes a time limit or (b) if management has required that a time limit.</p>	<p>4.8</p>
11	<p>The following standards are really NOT standards. Instead of such phrases follow the instructions in #8 and #9 above.</p> <ul style="list-style-type: none"> <li>• must be done to 100% accuracy.</li> <li>• must be correctly done.</li> <li>• must look correct or normal.</li> </ul>	<p>4.8</p>
12	<p>List the machine or assembly on which the work will be done <b>first</b> in any list of conditions. Be specific.</p>	<p>3.1</p>
13	<p>There should never be any mention about training or the process of learning the task – especially in the conditions. For example, never mention “the trainer,” classroom, course, lecture, video, training aid, class discussion, or class exercise. [Exception is in the <i>indicator</i>, Step 4f.]</p>	<p>5.3</p>