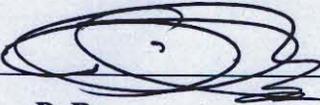# PPS Group Software Configuration Management Procedure

This document has been approved by:

_____   11-30-2007
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Purpose

This document describes the file handling process in order to maintain version control over PPS software. There are two aspects to this process: obtaining the correct released version of application software for uploading into a programmable device, and proper handling of software in and out of version management software while revisions are being made.

1. Configuration Management Tools

The open source version control software system Concurrent Versions System (CVS) is utilized as the PLC software version control tool. A qualified member of the Controls Department Software Group will serve as CVS Manager, effectively a consultant to configure permissions and other CVS variables to be consistent with PPS needs. Concurrent work (two developers working on the same piece of code at the same time) will not be allowed for PPS software.

CVS automatically generates CVS version numbers as new software revisions are placed in the CVS Library. These numbers nominally cannot be manipulated. However, CVS allows the generation of a CVS version tag when new versions are places in the Library. Versions can also be withdrawn by CVS version tag identity; the CVS version number does not need to be known. This CVS version tag, controlled by PPS developers, is the version number used to identify specific versions of code. It is also the version that will be coded into Allen Bradley and Pilz application software for confirmation of the version in operation, referred to as the internal version tag in this document.

2. Released Versions

The reviewed and approved released versions of PPS software are stored in the CVS Library. They are readily identifiable as the largest whole integer version number listed (X.0.0) and should also be identified in the released version log. For a variety of technical reasons, PPS software cannot be directly uploaded into a PLC from the CVS Library. Middle-man devices must be utilized such as a laptop and/or external memory devices. Specific procedures with step-by-step instructions to perform this task are available for various PPS hardware. To prevent uncontrolled copies of PPS software floating around, an essential part of these procedures is to immediately delete the middle-man copies following the software upload.

3. Revision Process

A revision to PPS application software may be driven by a change in performance requirements, a desired improvement in performance and functionality, or by the discovery of unintended functionality. In any case, the starting point for a revision is the latest released version obtained from the CVS Library. Upon retrieval, the first action of the developer is to increment the working version number.

The version numbering scheme utilized by the PPS Group is as follows for version numbers in the form 'X.Y.Z':

X	Release Version	This version number is incremented when an SSRO-sanctioned review approves the release to production of a revision. The 'Y' and 'Z' numbers are zeroed when this number is incremented.
Y	Review Version	This version number is incremented for each review cycle until a release version is approved. The 'Z' number is zeroed when this number is incremented.
Z	Working Version	An internal version number that is used to differentiate versions during the development process. It is at the discretion of the developer to manage these versions informally or in CVS.

If a piece of PPS application software, version '1.0.0' for example, is withdrawn from the CVS Library for the purpose of revision, the first action of the developer is to change the internal version tag to '1.0.1.' Depending upon the complexity of the change and the amount of bench testing, the software may be versioned up to '1.0.5' say. When the software is ready for formal review, it is versioned up to '1.1.0.' If this version is approved by the review, this same version becomes version '2.0.0' when released for field use. However, if some problem was discovered in version '1.1.0,' the developer would continue work on version '1.1.1.' The follow-up review would scrutinize version '1.2.0' of the software. New code begins with working version '0.0.1' and ultimately will be first released at version '1.0.0.'

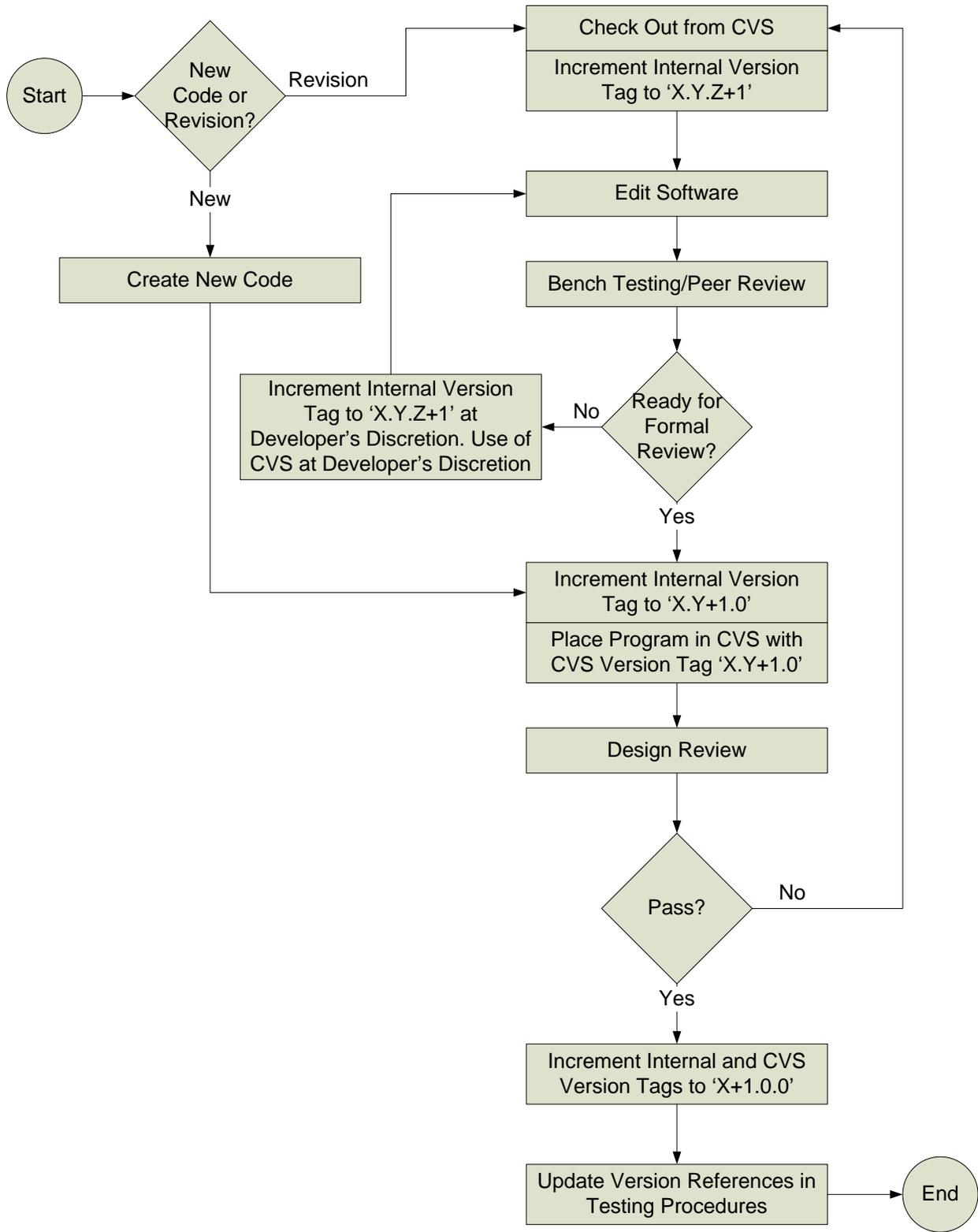This version management process is illustrated below in Figure 1.

Figure 1: PPS Group Software Management Flowchart