CEMD 0920

Salt Lake Community College

Basic Manufacturing Skills Week 4

c3bc Community College Consortium for Bioscience Credentials
DTC-23765-12-60-A-37

This product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. This product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

Manufacturing Basics: Manufacturing Components

- What are the 3 Manufacturing Components?

1. Raw Materials
    - The things upon which manufacturing activities will be done
2. Manufacturing activities
    - Transformation of raw materials
    - Requires instructions - read, understand, & perform
3. Verification
    - Compare the finished product to a standard or pass QA acceptance criteria

Salt Lake Community College

Manufacturing Components

- Raw Materials –
  - –must be received and checked for quality prior to release for Manufacturing Activities
  - –must be tracked throughout its use in the Manufacturing Activity by using an ID code (usually a “part number”)
  - –the ID code will appear on all B.O.M. and Work Instruction Documents
  - –the ID code is used for material traceability

Salt Lake Community College

When the Manufacturing Components are in place, the following questions can be answered:

- Are they adequate for the task?
  - DMR (design and QA procedures)
- Are they the right raw materials to use for this process?
  - Bill Of Materials (BOM)
- What exactly do I do with these materials?
  - Work Instruction Document
- Do I have enough of them to complete the process?
  - Line Clearance
- Where did these raw materials come from?
  - Batch Record (traceable by lot number back to Purchase Orders)
  - .

Salt Lake Community College

Manufacturing Components Cont. 1

- Raw Materials –
  - –Once raw materials are received and released into the manufacturing activity, they are tracked … how?

    By use of a Part Number that will:
    - Define the characteristics of the item
    - Drawings and/or specifications
    - Used as a locator to find the item in the database

    By use of a Lot number that:
    - Identifies small, manageable quantities shipped from the supplier
    - Identifies date-sensitive materials for production scheduling

    By use of a Revision number that:
    - Tracks changes to the specific part
    - Maintains traceability of a part number

Salt Lake Community College

Manufacturing Activity

The Manufacturing Activity is carefully controlled and monitored by the Quality Management System

- –by a series of documents for every part of the activity:
  - Bill of Materials (BOM)
  - Work Instruction Documents (WIDs)
- How did this come about?

Salt Lake Community College

Defect Awareness

- CFR820.25 Personnel
- (b) *Training.* Each manufacturer shall establish procedures for identifying training needs and ensure that all personnel are trained to adequately perform their assigned responsibilities. Training shall be documented.
  - As part of their training, personnel shall be made aware of device defects which may occur from the improper performance of their specific jobs.
  - Personnel who perform verification and validation activities shall be made aware of defects and errors that may be encountered as part of their job functions.

Salt Lake Community College

Training – why is it important?

There are 2 very good reasons for Training:

1. It is part of the Lean philosophy of manufacturing
   – Remember, Lean operations require practice and constant attention to INCREMENTAL improvements
2. Federal Law requires it!
   –good training enables this

21 cfr part 820

Salt Lake Community College

Manufacturing Training- (cGMP requires it!!!)

All training must be documented to satisfy CFR 21 Part 820.25!!!

- Operators must be trained to the current revision
- Special processes may benefit from Certification
  - For example, specialized processes, like wave soldering or welding may require instant verification that the process was performed properly.
  - Usually requires additional education or schooling

This is LEAN manufacturing practice because it leads to overall reduction in waste and scrap!!!

Current Good Manufacturing Practices

Manufacturing Training- (cGMP requires it!!!) Cont.

All training must be documented to satisfy CFR 21 Part 820.25!!!

- But remember, that this CFR leaves it to the manufacturer to establish what the appropriate training is for any given process
- The manufacturer must justify its decisions about what is “appropriate”

This could be a college degree, or in house training, or some kind of outside certification…but it must be DOCUMENTED!!!

Salt Lake Community College

USA (FDA)

- 21 CFR 820 Quality System Regulation for Medical Device
- 21 CFR 11: Electronic Records & Electronic Signatures
- FDA Regulations Beyond QSR Labeling, MDRs, Recalls, etc.

Non-USA

- ISO 13485 European, Canadian, and International QSR specifically For Medical Devices
- MDD 93/42/EEC Medical Device Directive (tied to CE Mark)
- JPAL Japan's Law for Medical Device
- CMDCAS Canadian Medical Device Regulation
- SFDA China's "state" FDA

Salt Lake Community College

Submissions

510 K

premarket notification showing a device is

“at least as safe and effective, substantially equivalent, to a legally marketed device”, allowing companies to sell in U.S.

Inspections

Routine

QSIT provides guidance; a “top down” subsystem approach reviewing the quality system (Full or CAPA +1 (Design or P&PC) and management controls)

Every 2 years for Class II and III device manufacturers, and prior to PMA approvals and 510k for Class III

For Cause

In response to recalls, observations from previous inspection, serious complaints, suspicion of fraud, etc. More in-depth than routine inspections.

Enforcement

- Review MDR
  - Medical Device Report (MDR)
  - Possible serious injury or death.
- Adulterated & Misbranded Product
  - Contaminated or nonconforming to cGMP; labeling is misleading, inaccurate, inadequate.
- Escalation
  - 483s, Warning Letter, order to repair/replace/refund, PMA suspension/withdrawal, prohibition or import, device seizure, Consent Decree, criminal prosecution, civil penalties

Personnel

If you are asked to do something for which you are not trained, what should you do?

- Do not proceed.
- Discuss training need with your supervisor.
- If that does not resolve it, discuss with +1 manager

Salt Lake Community College

GDP

- We should follow Good Documentation Practices for ALL documents and quality records…make GDP a habit!
- Records are required to be:
  - Legible
  - Retrievable
  - Stored
  - Maintained to demonstrate

Salt Lake Community College

Documentation “DO”s

- Ink: BLUE or BLACK permanent ink,
- Red Ink (ONLY for redlines).
- Date: Use preferred MM-DD-YY
- Time: 3:24 PM or 1524 (military time)

Salt Lake Community College

Documentation “DO”s Cont.

- Initials: First letter of first name + first letter of last name. Include the date.
- Signature: sign in your own handwriting; no typing. Include the date.
- Attachments: include title, number of pages, sign and date. Supplementary information such as emails may be used as supporting documentation.
- All DHR Graphs: title and label axis, units of measure, initial and date

Salt Lake Community College

Documentation “DO”s Cont. 2

- Blanks: “N/A” in blanks if data does not apply. Initial and date all “N/A”(s) unless you are the document final approver.
- Whole page N/A: diagonal line across the page with “N/A” with initial and date. Create additional document if original record becomes unclear. Attach lined out original with explanation.

Salt Lake Community College

Documentation “DON’T”s

- Dates: never pre or post date
- Sticky Notes: don’t use; not official, so steer clear
- Correction Tape / White Out / Overwrites: Never use!
- Relevancy: do not write unrelated notes on a record
- Highlighting: do not use highlighters

Salt Lake Community College

Documenting TEST RESULTS:

- Base on objective evidence
- Explain, initial & date any deviations from the protocol
- Explain, initial and date any failures and actions you took
- Use approved and released data / test sheets
- Do not use ditto marks or arrows
- Data Recorded in Decimals: should have a zero (0) preceding the decimal ex. 0.01

Salt Lake Community College

Documenting TEST RESULTS: Cont.

- Only round on the final answer, do not truncate intermediate values.
- If the digit following the last significant digit is less than 5 round down.
- If equal to or greater than 5 round up
- Record “PASS” “Complete”/”Done” or “FAIL” to demonstrate specific outcome
- Record both qualitative and quantitative results

Salt Lake Community College

Error Correct

- Single line through error
- Write correct information
- Initial and date
- Add explanation if the reason is not apparent, use asterisks or numbers for longer explanations.

Salt Lake Community College

Identification and Traceability

- At any point in the manufacturing process, we should be able to:
  - Identify the individual product during all stages of receipt, production, distribution and installation.
  - Track the history of all parts and materials that were used for producing our devices.
- All component and material identifying numbers will be recorded on a device's DHR so that any issues with the device can be readily traced.
- Records MUST be thorough, to determine exactly where a problem occurred. This allows us to better identify a Non-conforming product quicker.

DHF, DMR, DHR Overview

- Design History File (DHF): the records that describe the design process and its changes for a device over the time; includes past versions of all the records in your DMR. The Design History File explains how you developed the recipe for making your device.

  Device Master Record (DMR): could be considered the output of the DHF, it is the set of specifications developed for current design and manufacturing; all the documentation for design and manufacturing of your current product. The Device Master Record is the recipe itself (specifications, work instructions, inspection procedures, etc.) for making the device.

  Device History Record (DHR): is the evidence that a lot, unit or batch was manufactured in accordance with the DMR; includes all production batch records. The Device History Record is the evidence that a particular unit, batch or lot of devices was made according to the recipe.

- All of these assume that all actions, processes and decisions are fully documented.

Device Master Record (DMR)

- Device Master Record (DMR)
  - What is it? All specifications related to the current revision of a device.
- Contains:
  - Device Specifications
  - Product Process Specifications
  - Quality Assurance Procedures
  - Packaging and Labeling Specifications
  - Installation, Maintenance & Servicing Procedures

Device History Record (DHR)

- Device History Record (DHR)
  - What is it? The evidence that a particular batch of devices was manufactured according to specifications.
  - Contains all evidence that the device/product meets requirements.
- Contains:
  - Date of Manufacture
  - Quantities Manufactured and released for distribution
  - Acceptance records (as defined in DMR)
  - Label examples
  - Device/product identification codes

Document revisions

- Document revision must be documented.
- The usual method is by use of a Change Order.
- Change Orders are used for any changes to released documents to record what is being changed and the new revision number.
- Use the “Track Changes” function in WORD to create a “redline” document that shows reviewers what changes are being made.

Salt Lake Community College

Document Revisions Cont.

- Send “redlines” to reviewers so that they can see what changes are being made.

- Homework: a document is posted on Canvas with notes specifying what changes need to be made. Make a redline revision incorporating the changes and submit.

Salt Lake Community College

Good Documentation Practices

Your company may establish standards for the following:

- Initial/Date
- Corrections
- Performed by
- Recorded by
- Verified by
- Deviations
- See appendix for more guidance and details

Salt Lake Community College

Good Documentation Practices Cont. 1

Initial/Date

- All entries to a cGMP document must be accompanied by the identity of the person (initials or signature) and the date that the entry was made. This is required by the Code of Federal Regulations (CFRs) and serves as a tracking method to determine that a task was indeed performed and who did the work.
-
- Initials are the accepted standard method of identification. However, some operations require a signature. For example, an "Approved by" space must be filled with a signature, not initials.
-
- For larger companies with people that have the same initials you will need to make a standard. Examples of your signature and initials will also be recorded by the various companies.

Salt Lake Community College

Good Documentation Practices Cont. 2

Corrections:

- No handwritten changes or corrections will be made to the printed text of an approved cGMP document. Consult with your supervisor if you discover an error. Any changes required to an approved cGMP documents shall be implemented through the established quality system.
-
- When making a correction to a manually recorded entry on a controlled document performs the following steps:
- Place a single line through the incorrect entry
- Initial and date the adjacent to the cross-out
- Enter the correct data near the original entry
- The mistake must still be legible through the cross-out.
- Date of the correction is the date the correction was made, not the date the error was made.

Good Documentation Practices Cont. 3

Performed By

- Performance of a step must be documented at the time of completing the step and prior to moving on to the next step. Do not execute a step if the manufacturing procedure is not available for documenting necessary data at the time of execution.

- The following personnel may initial and date the “performed by” space
- Personnel already proficient in the task performed
- Or
- Personnel who are in training under the supervision of their qualified trainer

Salt Lake Community College

Good Documentation Practices Cont. 4

Recorded By

- The “Recorded By” space is used if the operator performing the operation is unable to initial and date immediately, due to working in a confined or restricted space, such as a laminar air flow hood. This situation is the only exception to the “Performed By” rule. Data must then be recorded by another person watching the operation. The person recording data must initial and date the “Recorded By” space prior to moving on to the next step.

Salt Lake Community College

Good Documentation Practices Cont. 5

- **Verified By**
- If verification is required, it shall be performed prior to moving on to the next step. Operators executing a task cannot verify their own action. At least one other person must review documentation for accuracy. Personnel may initial or sign and date the "Verified by" space if:
- They witnessed that a task, operation, or procedure was performed per written instructions and accurately documented
- And
- They are already proficient in the task performed
-
- **Deviations**
- If you deviate from a written procedure, you must
- Notify your supervisor
- Document the deviation using the appropriate quality system