Validation/qualification considerations

FDA regulations are not the only regulations that could determine how your freezer is validated and qualified. You may have to also consider the USP, JP, EP, ICH guidelines, WHO or other business-related governance organizations to prepare for a successful audit. Having an approved validation plan which includes instrument (freezer) testing and a sample management strategy is key to ensuring sample safety and successful audits.

Key takeaways/benefits/separating features

- **Installation Qualification (IQ):** Establishes confidence that process equipment and ancillary systems are installed to manufacture recommendations. Ensures that proper documentation is available.
  - Equipment is installed correctly according to Manufacturer and recommendations.
  - Do you have the operation and maintenance manuals?
  - Do you have the specifications and functional requirements documented?
  - Documentation of the software configuration and validation.
  - Documentation of the established operating parameters.
  - Documentation of any factory testing such as uniformity testing.
  - How will you capture the freezers installation/ maintenance/PM and repair work? Will this be done electronically or hard copy. This will include any pre-planned and scheduled PM work.
- **Operation Qualification (OQ):** Establishes confidence that process equipment and ancillary systems are capable of consistently operating within the manufacturer established limits and tolerances. This is done by performing temperature uniformity testing, known as temperature mapping.
  - Requirements for testing are dictated by regulations and/or best practices.
  - Use a quality team approved testing protocol. This will include how many sensors to use, where they should be located and how long to run the test.
  - This test is usually performed when the unit is empty.
  - This test is usually a static test.
  - It is critical that the test pass/ fail parameters are included as well as who will review and approve the test before moving on the PQ.
- **Performance Qualification (PQ):** Establishes confidence that process equipment and ancillary systems are performing to manufacture recommendation by demonstration with objective results. This is done by performing temperature uniformity testing, known as temperature mapping.
  - Requirements for testing are dictated by regulations and/or best practices.
  - Use a quality team approved testing protocol. This will include how many sensors to use, where they should be located and how long to run the test.
  - This test is usually performed with a simulated full load.
  - This test usually incorporates a door opening test to simulate a standard sample retrieval.

- Testing for different “real life” situations are also common. Power failure testing, shelf redistribution are examples of tests that may be performed.
- It is critical that the test pass/ fail parameters are included as well as who will review and approve the test before moving on the PQ.

- **Re-qualification:** A risk assessment should be done to determine how often the requalification should be performed. Annual and bi-annual testing is common. Re-qualification establishes confidence that process equipment and ancillary systems continue to perform to manufacture recommendation by demonstration with objective results which ensures sample safety. This is done by performing temperature uniformity testing.
  - To determine risk, consider that if a re-qualification fails, what investigative means do you have available to determine sample safety? How is this documented and how does possibly losing a sample impact your business? In the event of a failure, monitoring data and well documented maintenance can play a big role in the decision of sample integrity.
  - It is common to test the freezer with the existing sample load.
  - The PQ protocol is usually used to document the test and results and is approved by a business unit representative. Quality approval is not needed unless there is a question regarding the results of the test.
  - There is no need to take the unit out of service for sample storage other than during the test. This is a static test only with no need for door opening testing or other operation tests that may have been performed as part of the originally PQ before release of the freezer for use.
  - If you are using new technology and/or a new manufacturer, you can perform a few annual re-qualifications to establish “trust” in the freezer performance and then write a “change control” base on your data to extend the re-qualification to a biannual event. This is a good way to reduce cost of regularly scheduled testing taking into consideration sample safety.
  - Always have a sample back up plan in the event of a failure. Splitting samples in to 2 different freezers is a good way to minimize potential sample loss.

In review

It is critical to discuss and approve an asset management strategy with your quality team so that you can determine the documented path, instrument (freezer) procedures and qualification details (protocols) needed so that you will ensure that your instruments are operating in a qualified state. This will not only keep your samples safe but will also provide a path for documented evidence of critical data needed for an audit.

Here’s a quick look at at what the path could look like:

1. Create a strategy document and have it approved by quality and business management.
2. Write procedure(s) that will detail what the strategy document is intending to accomplish. Procedures should be approved by quality. Don’t forget to set up a review of the procedures so that you stay current regarding regulations and guidance practices.
3. Use the information captured in the procedure to create a detailed testing (temperature uniformity) protocol including the pass/fail criteria and supporting information pointing back to the procedure. For example: test at -75°C for 24 hours. All sensors must stay within +/-10°C of desired temperature of -75°C).
4. Don’t forget to have a plan to address a test failure or deviation of the test. Your quality team should be involved in the process.
5. Sample safety is the goal. It’s common to purchase back up units to so that sample inventory can be split to provide another level of security. Not only for a testing failure but also a place to move sample during a repair or catastrophic event.

Find out more at **thermofisher.com/ult**

ThermoFisher SCIENTIFIC