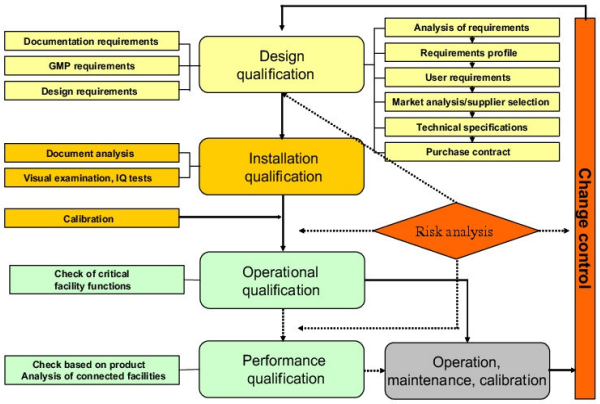
Qualification – official requirements

Part 2 of 4

Authors:
Dr. Michael Hiob
Max S. Lazar

Design Qualification (DQ)

The qualification of facilities and equipment is part of a life cycle (Figure 6.A-1).



The first stage of a qualification should be the design qualification (DQ). According to Annex 15, conformance of the design with the GMP requirements should be demonstrated and documented.

The design qualification encompasses the documentation of the planning phase including the decision as to which facility will be used. The DQ should define the requirements for the intended facility.

6.A-2 Contents of the design qualification (DQ)
1. Purpose of the equipment/facility
2. Legal requirements (laws, regulations, standards)
3. Design requirements ¬ Technical data ¬ Construction and workmanship ¬ Accessories and spare parts (e. g. balances, code readers, components) ¬ Materials of product-contact parts
4. Requirements for the installation ¬ Dimensions ¬ Environmental conditions (rooms, energy, utilities, HVAC, safety, environment)
5. Performance data ¬ List of products (specification; in particular, dimensions; special features) ¬ Description of the sequence of operation (flow chart, variability of the process, conditions) ¬ Pulse frequencies, quantity produced ¬ Setting-up times
6. Facilities for control, regulation and measurement
7. Requirements for maintenance, cleaning and care
8. Evidence of the functionality of the equipment/facility, e. g. records of trial runs at the premises of the facility manufacturer (final acceptance documents)
9. Requirements for the accompanying documentation ¬ Technical documentation ¬ CE, UL and any other appropriate certification certificates of conformity ¬ Calibration and gauging certificates ¬ Operating instructions ¬ Certificates for materials ¬ Spare parts list ¬ Quality certificates for software, source code if required ¬ Documents for training and instruction of staff
10. Customer service
11. Necessary supplementations and modifications following award of contract
12. Installation schedule at premises of contract giver

The requirements of the contract giver for the scope of supply and services (cf. Figure 6.A-2) (user requirements) or the agreement with the contract acceptor regarding implementation and handling of the project (technical specification) are

described in the design qualification documents. Before acquiring a new facility, the manufacturer must first determine the requirements (processes, products, capacity) that must be catered for. A number of different areas at the company are usually involved in the assessment of requirements that may be used to derive an informal requirement profile for the new facility. This requirement profile is transferred to the user requirements. The requirements of users including all limiting conditions must be described in the user requirements. It should be possible to qualify and test these requirements. The user specifications describe the economic, technical, and organizational expectations of the contract giver in relation to a facility, and they also define the objective and purpose of the facility.

When compiling the user requirements, a differentiation should be made between essential (compulsory) requirements and desirable (optional) requirements. In practice, it will not be possible to implement all the ideas of the future operator. Whether a facility manufacturer for a specific facility can be found and whether he is capable of delivering a suitable quality always depends on the market situation. A thorough market analysis will therefore determine what offers are available. It is quite possible that changes to the user requirements may be required as a result of such an analysis as new aspects in relation to the design of the facility may come to light that could not be taken into account when the user requirements were compiled.

Not all suppliers in the market will be in a position to guarantee that the facility will be designed and produced according to the principles of Good Engineering Practice (GEP) as defined in the standards and guidelines (baselines) of the ISPE (International Society for Pharmaceutical Engineering): "Established engineering methods and standards that are applied throughout a project's 'life cycle' to deliver appropriate, cost-effective solutions". When selecting a suitable supplier, checks should not only be made to establish whether the manufacturer actually supplies the required facility, but also to determine whether the manufacturer can provide evidence that he is able to comply with the aforementioned principles of GEP. This check must be carried out as part of a supplier qualification and should also consider aspects of service such as support during qualification, instruction of operators and maintenance.

The user requirements are dispatched to suitable suppliers following the supplier qualification (GMP MANUAL chapter 18.G). The suppliers compile a technical specification on the basis of the user requirements and forward this to the prospective customer as part of a quotation for the conclusion of a purchase contract.

The user requirements are detailed in the technical specification and the implementation requirements described in an extension with reference to specific approaches. A definition is given in the technical specification as to how the requirements are to be implemented and what is to be used to achieve this.

Basically, the design is determined to be qualified if the technical specification corresponds with the user requirements. A documented comparison of the technical specification by the manufacturer/supplier of the facility with the user requirements of the pharmaceutical manufacturer should demonstrate that at least the compulsory requirements have been satisfied.

Before the purchase contract is concluded, or before the facility is delivered, it may be necessary to make sure that the user requirements are complied with at the manufacturer's premises (Factory Acceptance Test, FAT - "The partial commissioning and qualification of equipment and/or systems prior to their shipment from the fabricator's site", ISPE). To do this, a visual inspection of the facility is carried out at the manufacturing site. If required, and if circumstances permit, suitable test runs are carried out.

Installation Qualification (IQ)

The correct implementation of the aforementioned requirements when assembling/setting up the facility is documented in the installation qualification (IQ) (cf. Figure 6.A-3). The check of the installation is generally carried out on the basis of the requirements previously established during the design qualification.

The installation qualification should be carried out on new or modified buildings, systems and equipment as defined in the glossary of Annex 15: "The documented verification that the facilities, systems and equipment, as installed or modified, comply with the approved design and the manufacturer´s recommendations".

The contents of Figure 6.A-3 constitute the minimum requirement for the scope of the installation qualification.

6.A-3 Installation qualification according to Annex 15

- Installation of equipment, pipes, supply facilities and instruments following check against current engineering drawings and specifications
- Compilation and comparison of operating procedures as well as maintenance requirements of the supplier
- Requirements for calibration
- Verification of construction materials

The installation qualification serves as a check of the documents that were required for the design qualification. These include the drawing of the facility, lists of settings, lists of components, instruction manuals, operating instructions, circuit diagrams, spare parts lists/wear parts list, maintenance and cleaning procedures, certificates (material, CE etc.), calibration documents, software and hardware documents and a list of product-contact parts (surfaces and materials). The documents must be correct, complete and up to date.

A visual examination is also carried out of the components delivered, to ensure fault-free workmanship, correct assembly and set-up, correct implementation of all utility connections, and connections with upstream and downstream machines.

The individual working steps should be carried out using inspection or work sheets (with a uniform layout) and the acceptance criteria established at the design qualification stage as a foundation.

All deviations or changes identified during the installation qualification must be documented to be used as the basis for assessing the need for the compilation of a defects list (including responsibilities and deadlines). The results are then listed in an appropriate form in the final report and comprehensively checked once again.

If it can be demonstrated that the installation of the facility corresponds with the relevant specifications, the installation qualification may be finalized with the signatures of the responsible persons.

Authors:

Dr. Michael Hiob - Ministry for Health of Land Schleswig-Holstein, Germany

Max S. Lazar - FDA Regulatory Compliance Consulting, USA

