The aim of process validation within Site is to establish and validate quality product that can be determined by final product testing, i.e. to build quality into the product.

5.2 **General Process Validation Requirements**

All process validation activities will be performed following a pre-approved protocol as per the requirements of SOP **VAL-115 P***rocess Validation for Liquids and Solid Dose Manufacturing***.** The protocol shall specify critical steps, critical process parameters, sampling requirements, and acceptance criteria.

All process validation activities will be documented in an a final validation report that will summaries all batches manufactured as part of the protocol execution as per the requirements of SOP **VAL-115** *Process Validation for Liquids and Solid Dose Manufacturing.*

For multiple product introductions, modifications, transfers or retrospective validation a validation project plan may be written detailing validation requirements for the products. Validation project plans will be written according to SOP **VAL-125** *Guideline for the development of a Validation Project Plan.*

5.3 **Process Validation Prerequisites**

The ability of the manufacturing process and supporting systems (including analytical methods) to consistently achieve and maintaining process parameters must be demonstrated prior to process validation. Process validation prerequisites are documents in SOP **VAL-115** *Process Validation for Liquids and Solid Dose Manufacturing.*

If there is more than one item of equipment, which is of the same type, process validation can be performed on any item, provided that the equipment qualification has demonstrated that the equipment is of similar design and operation.

Bracketing of a validation exercise may be used where variants such as multiple strengths, batch size, process parameters or equivalent formulas are used. A worst-case approach should be used when bracketing. Justification for bracketing must be document and approved in the validation protocol.

Prior to validation, the process may require trial / qualification batches which may be performed on full scale or scaled down batches. These batches will be documented in trial protocols / Performance Qualification protocols prior to process validation. The requirement for trial / Performance Qualification batches will be based on risk.

5.4 **Approaches to Process Validation**

There are 3 acceptable approaches to process validation as detailed in **sections 5.4.1, 5.4.2** and **5.4.3** below. The approach used will depend on risk and will be documented in the process validation protocol. At minimum Validation and Quality Assurance must approve the selected approach through protocol approval.

5.4.1 **Prospective Validation**

Prospective validation shall be used in validating a new or substantially modified process.

Prospective validation requires three consecutive successful product batches to meet all acceptance criteria for in-process and finished product testing as defined in the protocol. Specific justification and approval from Quality Assurance is required if three batches are not used to validate the process.

5.5.3 **Critical Parameters**

Critical process parameters (including ranges) and critical quality attributes of the process being validated must be identified and justified. The validation committee is responsible for ensuring that the ranges proposed in the validation protocol for critical process parameters are correct and have supporting documentation included or referenced in the protocol.

Where a change is required to a critical process parameter during the validation study, the effect of the change should be assessed for its impact on the validation study. The change may require restarting the validation study using the new critical process parameter value(s). The previous validation batches shall be evaluated and their disposition documented in the report. The assessment of the impact of the change on the validation study shall be documented in the validation report.

Changes in non-critical process parameters may prove necessary during process validation to improve the performance of the process while ensuring that the process produces products that meet acceptance criteria. Such changes shall be documented and justified in the validation report and evaluated for their impact (individual and cumulative) on the validation exercise.

5.5.4 **Homogeneity**

Homogeneity, including blend uniformity, shall be included or referenced in the validation protocol.

Homogeneity shall be demonstrated for a modified process when assessment of a planned change indicates a potential impact on batch homogeneity. If homogeneity is not performed as part of the validation study, a documented rational shall be provided in the validation protocol.

5.5.5 **Validation Sampling**

Sampling is an essential component of process validation. Process validation sampling will be performed as per SOP **VAL-100** *Process Validation Sampling.* In general when sampling it is necessary to consider:

- Release for sale requirements / product specification
- The design and configuration of the equipment
- Statistical requirements.

A practical and relevant sampling pattern, defining number, frequency, technique and pattern will be established on a case-by-case basis in individual protocols. Where sampling is performed, the specific sampling site must be identified in the protocol.

5.5.6 **Validation Testing**

All validation samples must meet the acceptance criteria specified in the validation protocol. Testing should be performed using validated or compendial methods. QC reductive testing or alternative testing using Process Analytical Technology (PAT) may be used where PAT methods are used to replace traditional test methods on validation samples only. If used the PAT activity should be integrated into the validation approach to provide information that will assist in the conclusion of the validation exercise. Any PAT testing must be performed using fit for use-qualified methods.

