

Validation, Qualification and Acceptance

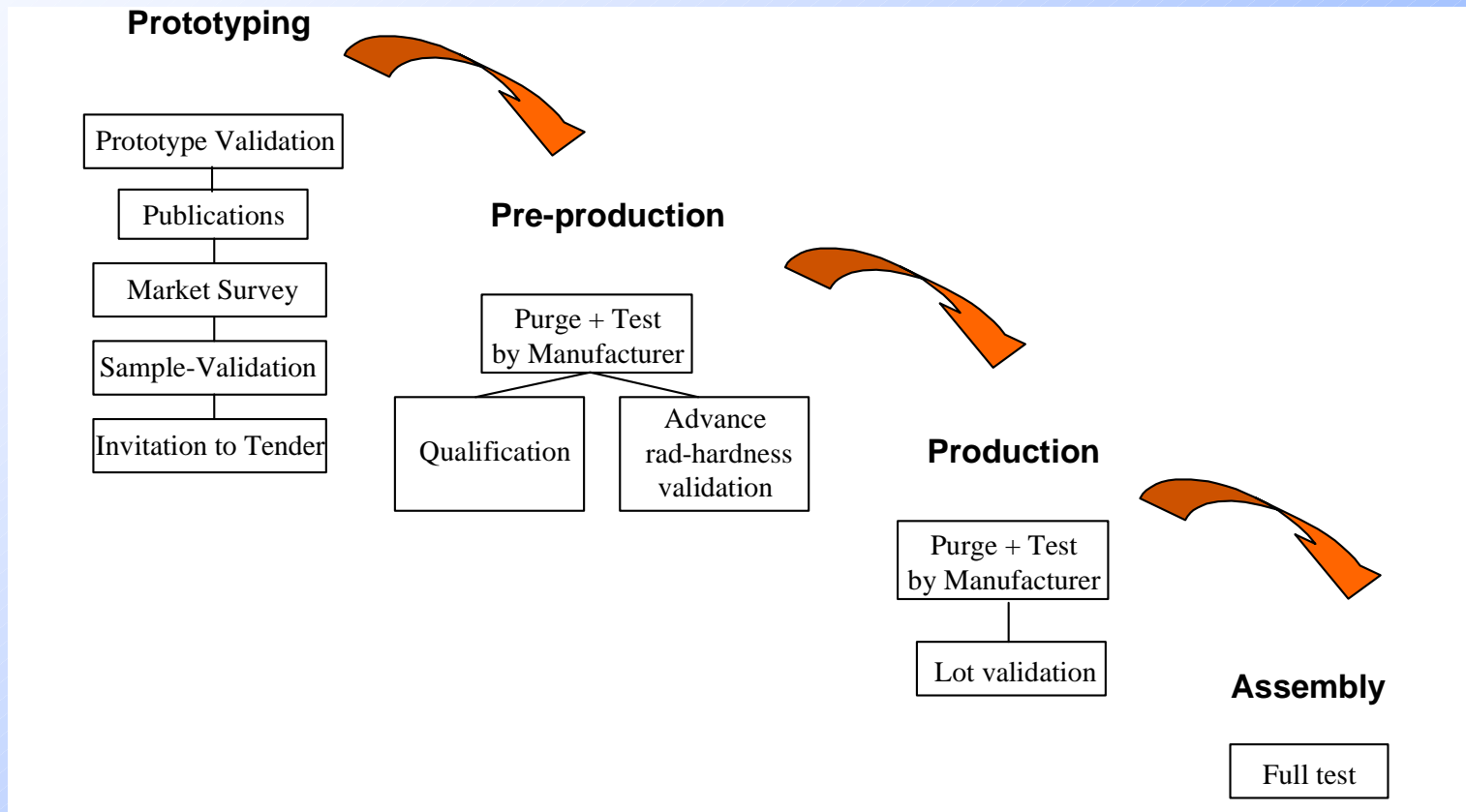


Outline

- QA manual contains procedures for
 - Sample validation
 - Advance Validation
 - Qualification
 - Lot validation

QA procedures

- Evolution of QA procedures

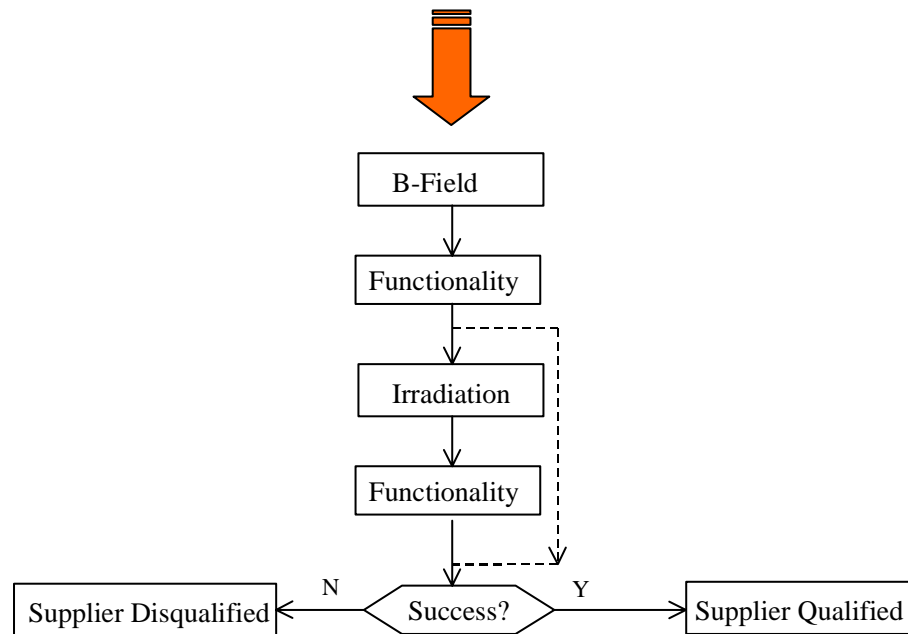


Sample validation

- Started with early prototype testing
 - functionality and radiation resistance
- Formal QA started in framework of Market Surveys
 - MS 2690 Lasers
 - MS 2691 connectors
 - MS2811 fibre/cable
 - MS2810 Rx modules (no CERN-specific env. Tests of Rx)
 - Allowed qualification of manufacturers

Sample validation

- Summary

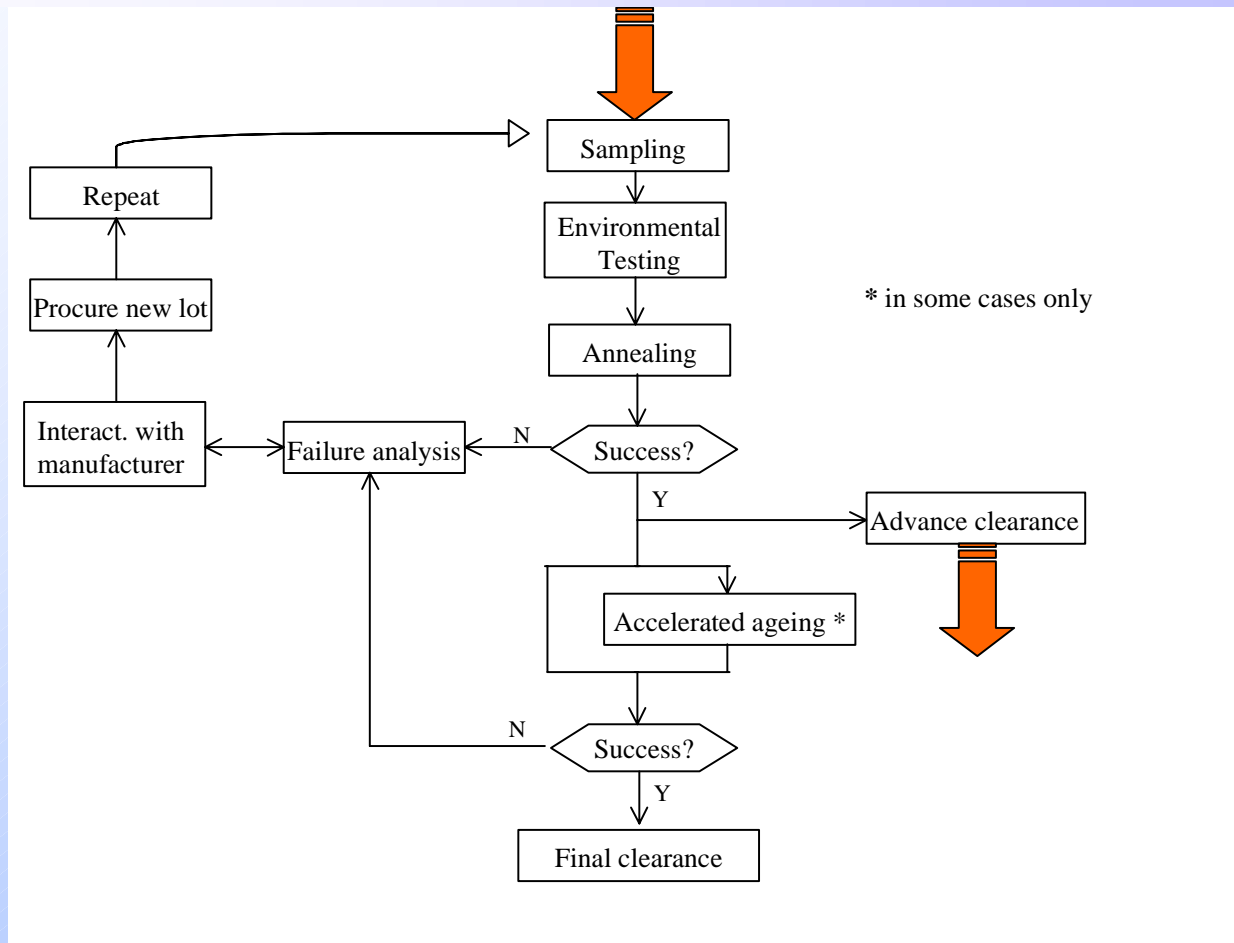


Advance rad-hardness validation

- Components qualified as market ready
 - However COTS not guaranteed radiation-resistant
- Avoid rejecting assembled devices due to non-compliance of sub-component
 - Advance validation of rad-hardness
 - laser wafers
 - bare fibre lots
 - Validated laser wafers and fibre spools stored and subsequently used for production

Advance rad-hardness validation

- Summary



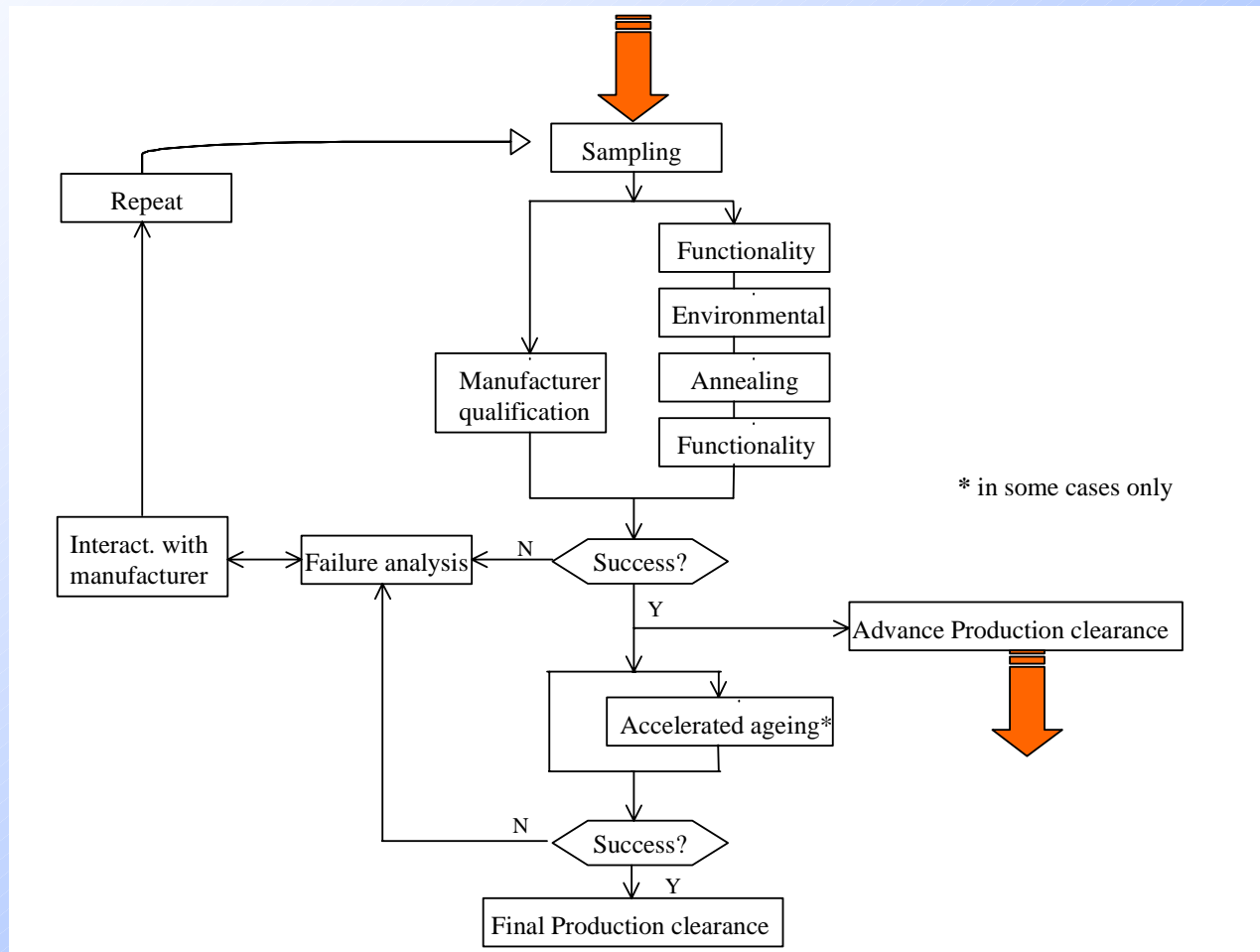
Qualification

- Rigorous testing of devices sampled from pre-production delivery
 - devices in final form
 - evaluation of compliance with specs
 - before/after environmental tests*
 - accelerated ageing#
- Allows qualification of device and manufacturing processes for full production

*maybe overlap tests with advance validation
#only for certain devices

Qualification

- Summary

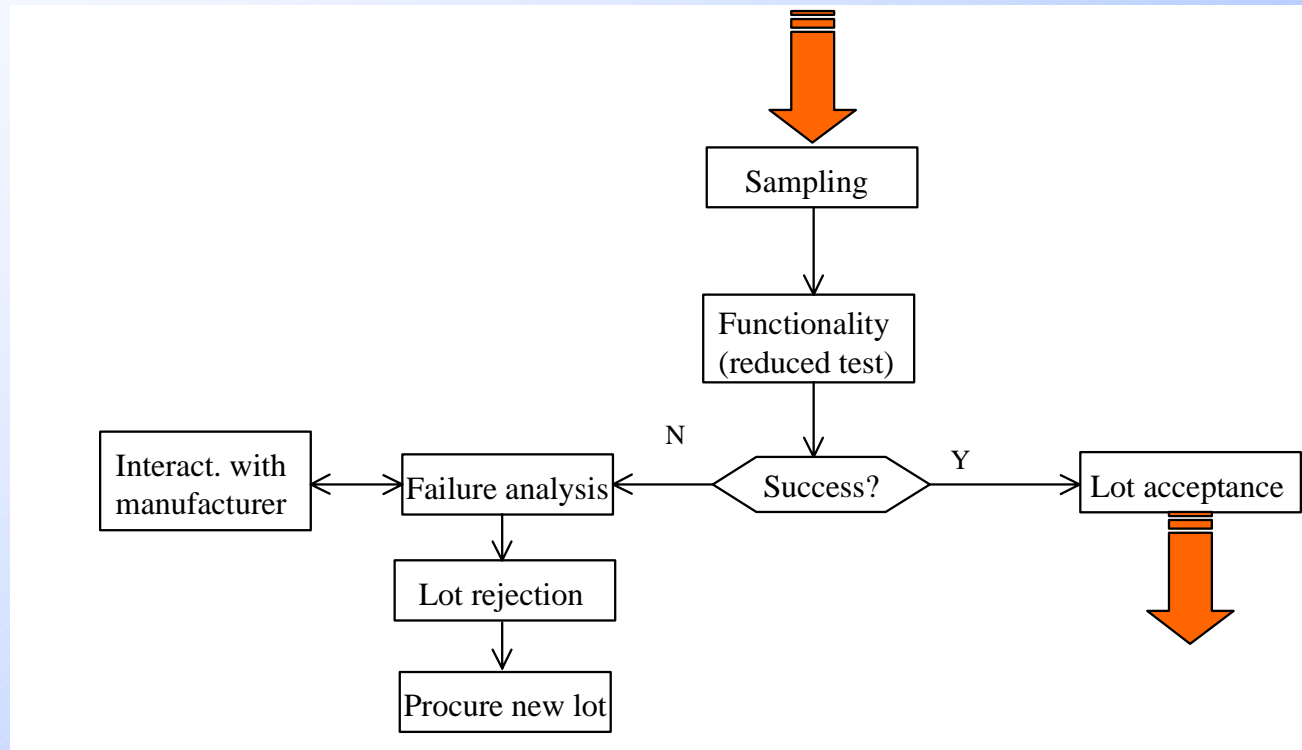


Lot validation

- After qualification, during production
 - manufacturers will test at 100% level certain parameters
 - (to be defined in contracts)
- Sample testing at CERN of each delivered batch
 - ~1-2% sampling level
 - sub-set of functionality tests
 - acceptance or rejection of lot based on compliance with specs

Lot validation

- Summary



Documentation

- Sample validation
 - publications of results from link development phase
 - available on www
 - Market Survey reports to manufacturers

- Advance validation, qualification, lot validation
 - Reports to be archived in EDMS database
 - copies to manufacturers

Conclusion

- Wide range of QA procedures implemented
 - based on accumulated experience
 - evolution from prototype development towards final production
 - good relationships developed with manufacturers
- Special procedure of advance rad-hardness validation
 - use of COTS in harsh environment