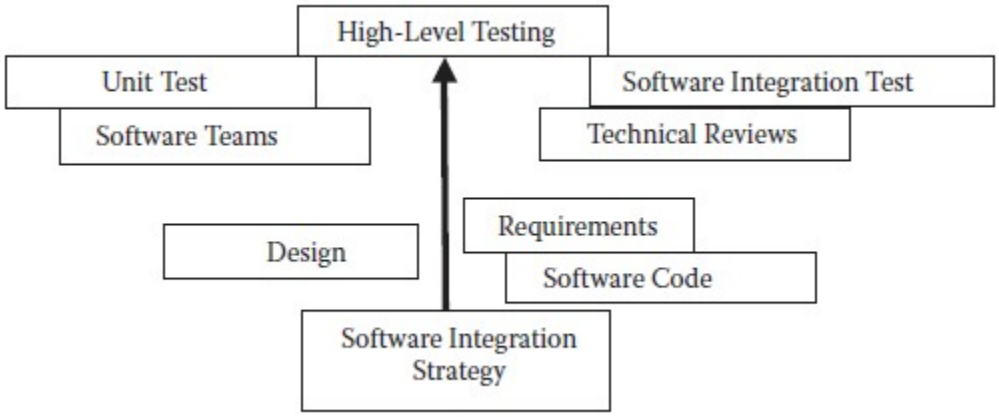
Software Integration

The software integration activities are informal and flexible for software checkout to prepare for the software and systems integration phase of the work product.
The strategy for software integration that describes the steps to be conducted as part of the implementation of software to start integration activities.

When a strategy is planned, resources are required. This strategy should be flexible and promote an approach that could show change.

characteristics:

• Effective technical reviews should be conducted
• Different integration techniques and software approaches are shown
• Software designers are required to be involved from the start to the finish



Approach:

The in advance planned approach to software integration accommodates lower-level integration to verify software code development that has been implemented correctly and validate major system functional expectations by customers.

Software Integration Testing

Test plans and procedures are developed to test systems and, if required, rerun integration tests that are to be witnessed by quality assessors or customers. The software test plans or procedures developed by program and project managers along with testing experts ensure that testing strategies are not wasted time during integration. Errors can appear that were previously undetected. That is the purpose of having plans and procedures in place.

Performing a review of test specifications prior to software integration testing is a strong attribute assessment before tests are complete. An effective approach to utilize a test plan or procedure for software leads to the order and discovery of errors at each stage in the test integration process.

The “bam theory” approach is to attempt nonscheduled software integration and testing.

SOFTWARE INTEGRATION SETUP

The software integration setup method involves planning with program and project managers to coordinate with the facility operations manager. Allocated resources such as computers (i.e., workstations) and hardware units are provided to the software designer/developer and test teams to conduct informal integration testing.

It includes

Integration Test

Inside programs and project integration facilities, system integration tests are conducted. Verification steps ensure tests provide a check of the capabilities of software and hardware units. The software integration test is to be repeated numerous times and ensures all integration test problems are resolved and

performance is accomplished early in the defined system and the system is working to software requirements.

Installation Plans and Procedures

Specific integration test plans and procedures consist of checkout activities to ensure system utilization. The integration testing environment provides necessary steps to be followed, data collected, and analysis solutions are used or implemented to produce test reports at the end of testing activities. The installation test plans and procedures are to be peer reviewed and approved for release by program and project managers to prepare for the start of software integration testing.

Integration and Checkouts

Early integration and checkouts focus on software components applied to tests to uncover errors. Once the components are tested, an informal system is constructed. Tests are executed to fix software bugs and errors. The recommendation of processing “draft-only” test plans and procedures provides loading instructions, execution, and the capabilities for uncovering problems early during integration testing. The software design and test engineers need to troubleshoot as early as possible before going into a formal test environment.

SOFTWARE INTEGRATION LOG

A software integration log provides a view of the day-to- day operations for the design and test teams using hardware units for integration and checkout. Facility operations managers use these logs to support operational setup activities. There are no formal released plans or procedures required during this informal phase of integration. Quality personnel are not required to support integration and checkouts performed by the software design and test teams. This is an effective method for conducting informal software testing in preparation for such activities in a facility for software and systems integration. Allow software design teams the freedom to fix and debug problems and work with test teams to ensure plans

and procedures will be ready for release to support formal test phases.

This software integration log is an effective method for the software design and test team to troubleshoot problems discovered during this informal test phase. Once the software is loaded into hardware units, the software does not have an impact on and take hardware out of configuration. I repeat: Software loaded in hardware units *does not* and *will not* have an impact on and take hardware out of configuration. Hardware quality and quality software teams butt heads concerning this issue. The quality team for software provides the correct answer, so please hardware quality follows its lead. No formal software plans such as step-by- step operational paperwork or tools in the manufacturing environment are required.

SOFTWARE TEST COMPLETION

The term *acceptance testing* is discussed throughout a software integration program and projects. There are always questions when this topic is mentioned or discussed. When will the software integration testing be completed? There is never an accurate answer, and that frustrates program and project managers. The burden is always on software engineering. Remember that the importance of quality is first and not second in any software program and projects. The pressure is on when integration testing keeps going on and on and not completed in time to deliver the S/SIL work products to the customer.
The metrics collected or testing models make it possible to develop guidelines for many answers to the question of when software integration and testing will be completed. Software integration is the first phase before any stage of systems integration. Understand that metrics do come into play in the early stage of software integration and testing. All program and project managers need to implement and use metrics instead of solving problems with no data to support and make key decisions.

INTEGRATION VERIFICATION AND VALIDATION

One of the important software processes for integration is the element that is often referred to as verification and validation. The verification aspect is a set of tasks that ensure correct implementation techniques are in place to verify that the right work product is being integrated correctly. The validation concept ensures that the correct work product is the right product to validate. The quality team roles are to perform:

- Technical reviews
- Configuration management audits
- Progression monitoring during software integration
- Plans, procedures, and documentation reviews
- Qualification and acceptance testing
- Witnessing of implemented plans and procedures during integration and testing

Quality during software integration throughout the life cycle shows that proper methods and tools are being utilized. The real motive for quality can be applied for very large- and small-scale systems.

CONFIGURATION REVIEWS AND AUDITS

The importance of configuration reviews of software was discussed in my first book, *Software Engineering Reviews and Audits*. This step ensures all elements of software configurations are developed and are in control during software integration and test activities. Conducting and performing effective reviews and audits are key before entering into formal software and systems integration.