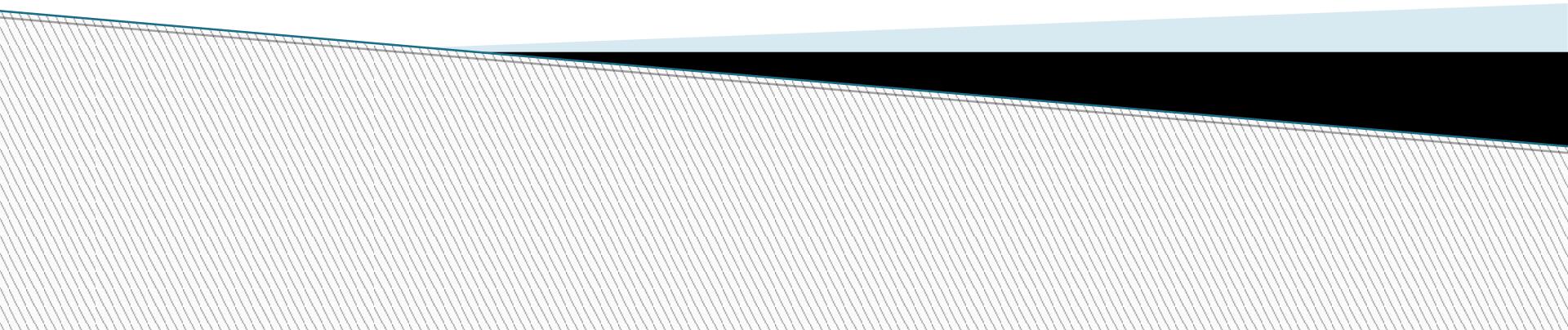# Software Quality Assurance (SQA)

Four Stages of Software Development

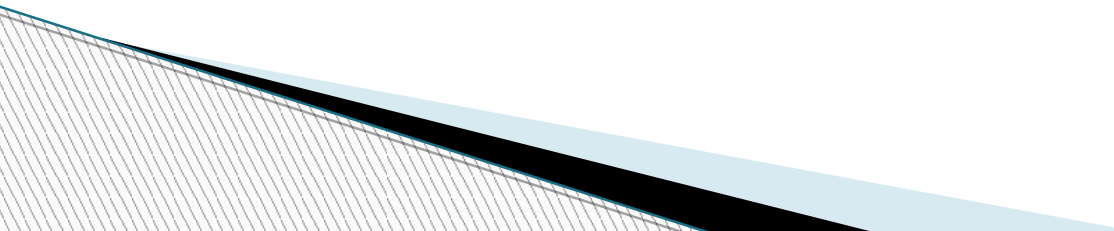- Software Requirements Specification
- Software Design
- Implementation (Coding & Module Testing)
- Integration & Testing

Each stage will require some sort of Software Quality Assurance (SQA).
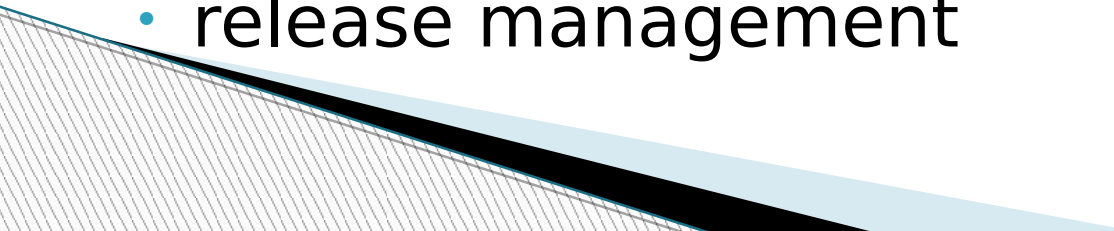
What is SQA?

In respective stages of software development

- **The degree to which a system, component, or process meets specified requirements.**

- **The degree to which a system, component or process meets customer or user needs or expectations.**

SQA

SQA encompasses the entire software development process

- software requirements
- software design
- coding
- source code control
- code reviews
- change management
- configuration management
- release management

IEEE Std 730-2002 SQAP

IEEE Std 730™-2002
(Revision of IEEE Std 730-1998)

730™

IEEE Standard for Software Quality Assurance Plans

IEEE Computer Society

Sponsored by the
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Targeted Audience

1. **The user**
   - Needs the product to meet the requirements identified in the specification.
   - Cannot afford a 'hands-off' attitude
   - Cannot rely solely on a test to be executed at the end of the software development time period.
   - Needs to obtain a reasonable degree of confidence that the product is in the process of acquiring required attributes during software development.

2. **The supplier (developer)**
   - Needs an established standard against which to plan and to be measured
   - Needs a standard to 'pass down' to subcontractors.

3. **The public**
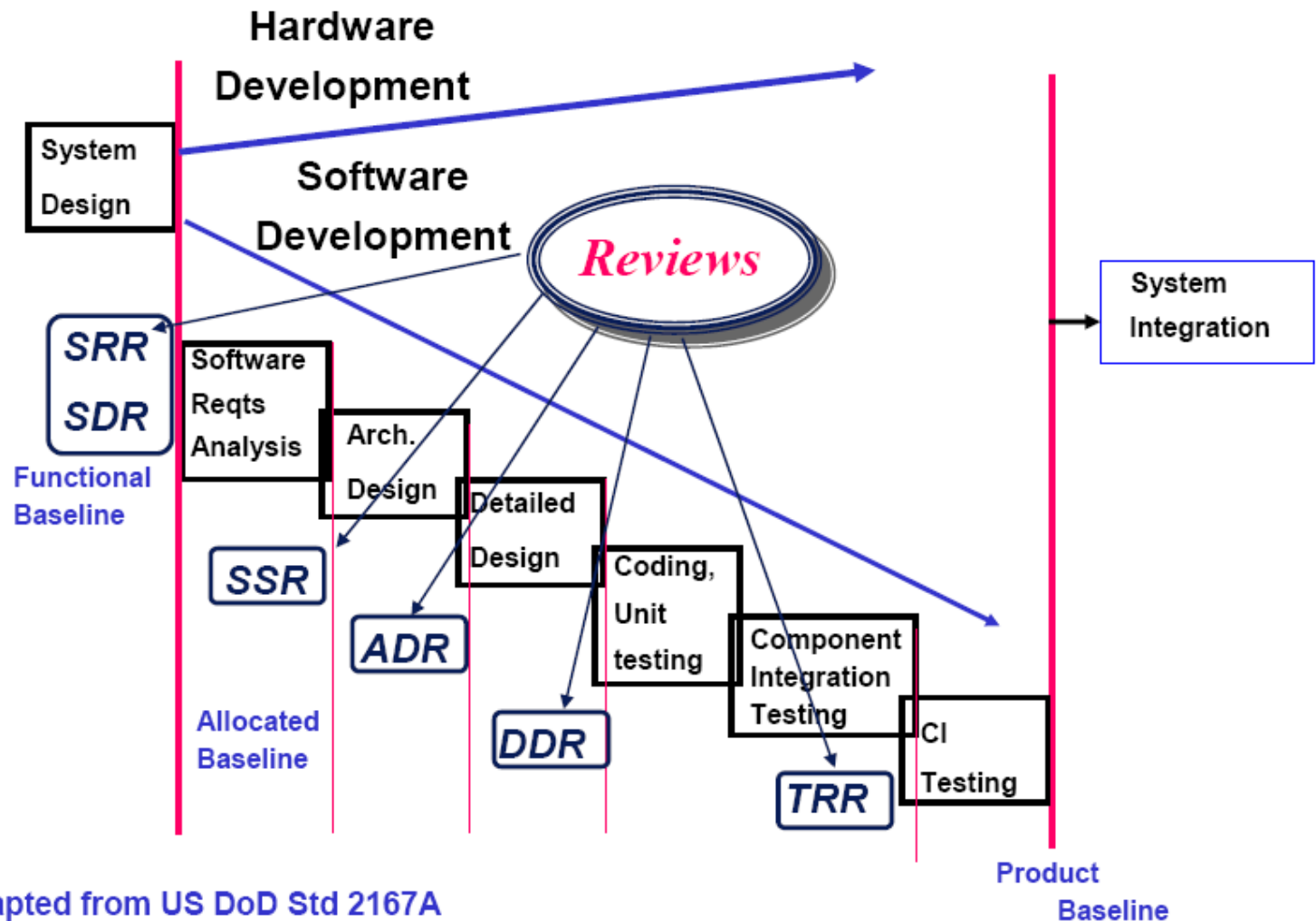   - May be affected by the use of the product.

Content of SQAP - Software Quality Assurance Plan[1]

- **<u>1. Purpose</u>**
- **<u>2. Reference documents</u>**
- **3. <u>Management</u>**
- **<u>4. Documentation</u>**
- **<u>5. Standards, practices, convention, and metrics</u>**
- **<u>6. Software Reviews</u>**
- **<u>7. Tests</u>**
- **<u>8. Problem reporting and corrective actions</u>**
- **9. Tools, techniques, and methodologies**
- **10. Media control**
- **11. Supplier control**
- **12. Records collection, maintenance, and retention**
- **13. Training**
- **14. Risk management**
- **<u>15. Glossary</u>**
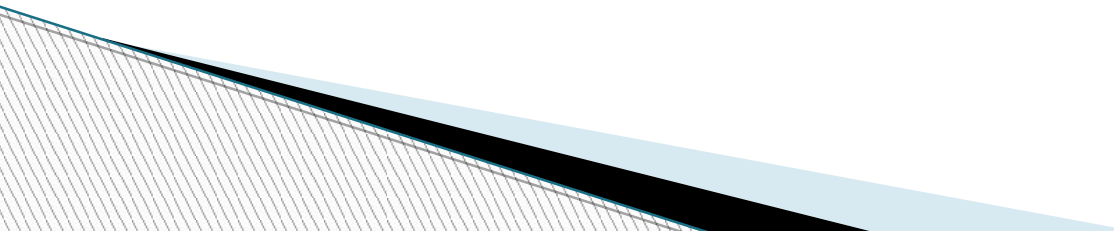- **16. SQAP change procedure and history**

[1] Underlined sections will be included in our project's SQAP

Reviews in Project Life Cycle

Adapted from US DoD Std 2167A

Testing

- Unit Testing – individual components are tested for correctness.

- Integration Testing - units that have already been tested are combined into a component and the interface between them is tested. Identifies problems that occur when units are combined.

References

- IEEE Std 730-2002, IEEE Standard for Software Quality Assurance Plans, Software Engineering Standards Committee, IEEE Computer Society, Washington, DC
- IEEE Software Quality Assurance Plans Slide Presentation, IEEE Computer Society, June 2008, http://profs.logti.etsmtl.ca/claporte/English/Enseignement/CMU_SPI/Notes/Plan/IEEE_Std_730_SQA_Plans.pdf
- DOD Std 2167C
- ANSI/IEEE Std 1008-1987, An American National Standard/ IEEE Standard for Software Unit Testing, The Institute of Electrical and Electronics Engineers, Inc. Three Park Avenue New York, New York 10016-5997, USA, 1993
- IEEE P1028™/D97.0 Draft Standard for Software Reviews and Audits, The Institute of Electrical and Electronics Engineers, Inc. Three Park Avenue New York, New York 10016-5997, USA, 2008