Software plays a central role in most technological sectors, and software trustworthiness is a crucial factor in systems and infrastructure across the world. To help our clients understand and manage software trustworthiness, Atkins offers a comprehensive independent software assurance service, covering development, testing and qualification:

- Expert software testing capability with wide sector / standards knowledge
- Scalable resources aligned with customer programme demands, eliminating need for fixed overhead teams
- Cost-effectiveness, using Atkins’ global resource base under rigorous UK governance and oversight
- Proven engineering management processes
- Objectivity and impartiality
- Deep engineering-based understanding of systems and infrastructure

Through this unique combination of capability, capacity, and cost-effectiveness, Atkins helps customers deliver successful projects at minimal risk.

Why independent?
As an independent engineering organisation working across multiple industry sectors, Atkins understands our client’s technologies, their application and criticality. Software failures, malware and cyber attacks can result in:
- Loss of life
- Damage to critical national infrastructure
- Unavailability of systems causing significant financial losses
- Loss of or damage to critical data leading to large fines and reputational damage
- Expensive rework

Atkins’ independence ensures objectivity and impartiality in the assurance of critical software, reducing programme risk and allowing customers to minimise costs by outsourcing assurance to Atkins only when needed.

Atkins’ approach
Atkins’ IV&V services have been developed from a baseline in the UK where the assurance of critical systems has traditionally been of the highest rigour and quality. We have evolved this approach to combine the same quality with our global resource base, providing access to large, cost-effective engineering resources.

The result is:
- Global team mobilisation for local delivery
- Value for money with UK technical oversight of cost-effective resource base
- Customer confidence through long-term IV&V partnering

Critical software IV&V
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Atkins’ services cover the entire software life-cycle “V”, from requirements derivation through to qualification and in-service support.

Atkins’ services

Consultancy
- Review of software processes
- Benchmarking against best practice and standards
- Advice on enhancing and developing processes for high-integrity software

Industry sectors
- Aerospace, Nuclear, Defence, Rail, Security, Communications, Oil & Gas, Critical National Infrastructure

Requirements verification
- User and system requirements
- Software criticality and cyber threat assessment:
  - Safety
  - Security
  - Business Integrity
- DOORS, RTM, Caliber RM

Software implementation
- Specialised team for high integrity software up to SIL 4
- Small and medium size applications
- Experience in developing and applying coding standards

Software auditing
- Formal audits of software projects
- Independent safety auditing
- Quality auditing
- Standard conformance

Requirements
- Architecture and design
  - Rational rose
  - System architect
  - UML
  - Structured methods

Software architecture
- Compiler verification
  - Use of MALPAS to formally verify object code against source code
  - Verify specific programmes, not compiler
  - Malicious code detection

Source code
- Static analysis
  - Function and integrity static analysis
  - Vulnerability assessment
  - All major languages
  - Conformant with all major standards to SIL 4
  - FRAMA-C, Polyspace, LDRA, SPIN

Unit testing
- Labview, LDRA Testbed, Cantata, Adatest, Rational TestMate
  - Statement coverage, branch coverage, MCDC
- Conformant to IEC 61508

Safety case authoring
- Software intensive systems
  - IEC 60880
  - IEC 50126/8
  - IEC 61508
  - Goal Structuring Notation
  - Modular Safety Cases
  - Software qualification and safety argumentation against industry standards

Design
- Design review
  - Test plans
  - Test readiness reviews
  - Test script
  - Requirements traceability
  - Performance testing
  - Stress testing
  - Integration testing
  - Hardware – software integration testing

System testing
- Acceptance and commissioning
  - Setting requirements for testing
  - Test planning
  - Test witnessing – test vs requirements traceability
  - Acceptance case process

System testing
- Test plans
- Test readiness reviews
- Test script
- Requirements traceability
- Performance testing
- Stress testing
- Integration testing
- Hardware – software integration testing

Verification and validation
- Test management
  - Setting requirements for testing
  - Test planning
  - Test witnessing – test vs requirements traceability
  - Acceptance case process

Executable
- Compiler validation
  - Use of MALPAS to formally verify object code against source code
  - Verify specific programmes, not compiler
  - Malicious code detection

Previous use
- Static analysis
  - Function and integrity static analysis
  - Vulnerability assessment
  - All major languages
  - Conformant with all major standards to SIL 4
  - FRAMA-C, Polyspace, LDRA, SPIN

Compiler validation
- Unit testing
  - Labview, LDRA Testbed, Cantata, Adatest, Rational TestMate
  - Statement coverage, branch coverage, MCDC
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