SAFECOMP POSITION PAPER:
USING ASSURANCE CASES TO SUPPORT TYPE APPROVAL AND REGULATORY COMPLIANCE IN THE AUTOMOTIVE SECTOR

Luke Emmet <luke.emmet@nccgroup.com>

9-Sep-2025

PT/1409/309/171

OVERVIEW

- About us

- Emerging standards and regulation for automotive type approval

- Challenges of demonstrating conformance

- Our approach - use an assurance case approach

- Conclusions

ADELARD
part of nccgroup

ABOUT US

- **Acknowledgements – the paper authors**
  - Robert Stroud (Adelard), Liz James (Transport C&I Group), Will Franks (Adelard)

- **NCC Group – global leader in cyber security and business resilience since 1999**
  - Adelard
    - Specialist safety practice
    - Digital systems, Socio-technical systems, Policy, Standards and Guidelines, Device assessment, Software analysis, AI Safety...
    - Established Safety and Assurance Case software tool provider – *ASCE*
  - Transport C & I Group
    - Specialist practice covering NCC's cyber services in transport domain

www.adelard.com

www.nccgroup.com

ADELARD
part of nccgroup

APPLYING AN ASSURACE CASE WITHIN AUTOMOTIVE TO SUPPORT TYPE APPROVAL

Key Question: How do I clearly and efficiently tell the whole cybersecurity engineering story to support various internal and external requirements?
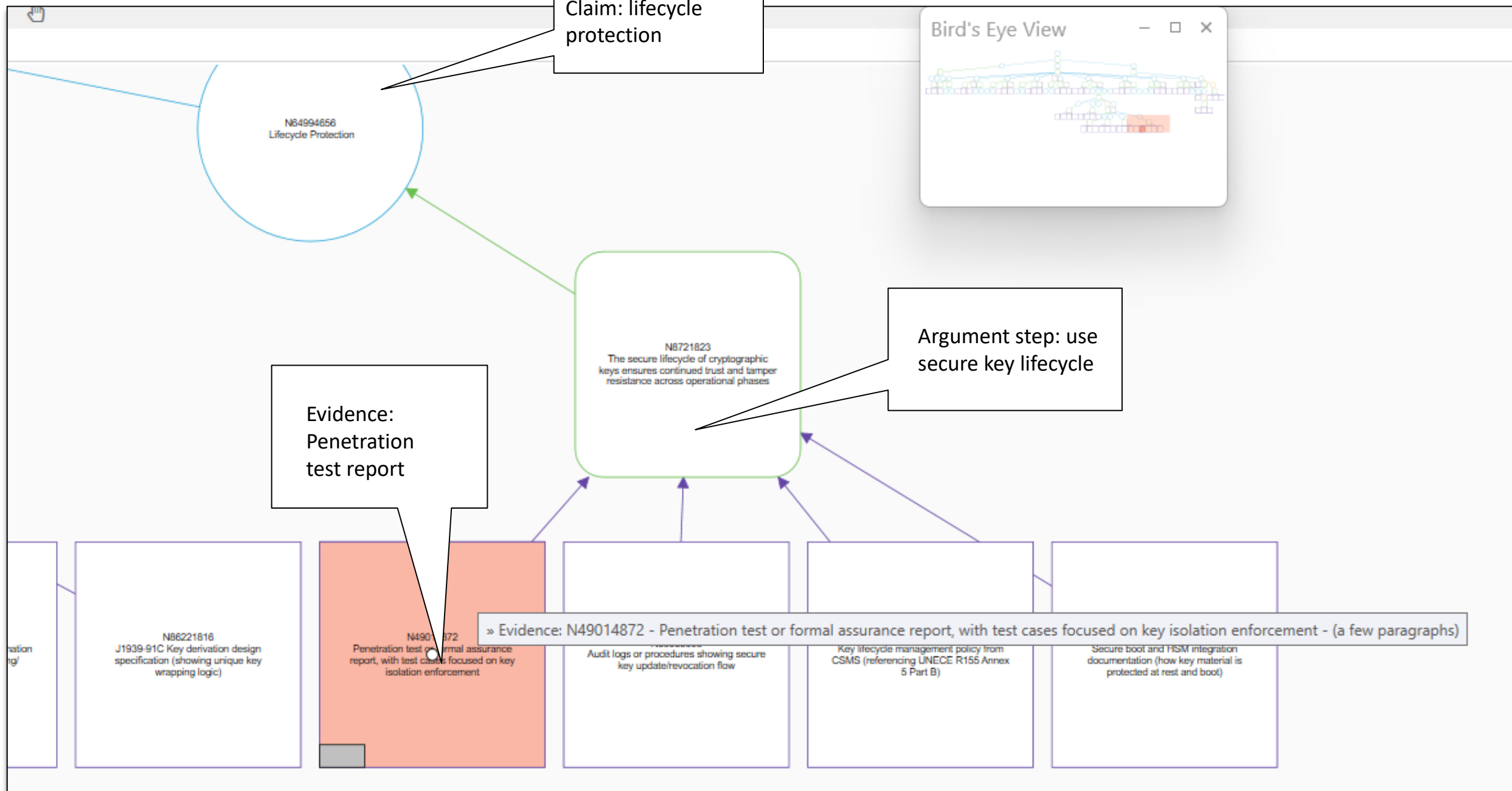
EXAMPLE – R155 ARGUMENT

CLAIM: THE VEHICLE MANUFACTURER FULLY COMPLIES WITH THE UNECE R155 REQUIREMENTS

Example Arguments:

- The **CSMS is documented** and includes threat identification, risk mitigation, and continuous improvement processes.

- **Independent audits** have validated the effectiveness of cybersecurity measures.

- **Cybersecurity controls** are embedded in the design phase and extend across the entire supply chain.

- **Security Event Identification and Vulnerability** management processes have been uniquely tailored to the product's risk profile

- **CSMS documentation** including threat models and TARA reports.

- **Audit reports** from accredited third-party assessors.

- **Test results** from penetration testing and vulnerability assessments.

- Examples of how secure design principles have been applied during **system architecture reviews.**

- **Case studies** demonstrating how Event identification and Vulnerability management has followed the policy and been applied in the real world.

Example Evidence:

ADELARD
part of nccgroup

EXAMPLE – EURO7 FRAGMENT

Claim: lifecycle protection

Bird's Eye View

N64994656
Lifecycle Protection

Argument step: use secure key lifecycle

N8721823
The secure lifecycle of cryptographic keys ensures continued trust and tamper resistance across operational phases

Evidence: Penetration test report

N86221816
J1939-91C Key derivation design specification (showing unique key wrapping logic)

N490...872
Penetration test or formal assurance report, with test cases focused on key isolation enforcement

Audit logs or procedures showing secure key update/revocation flow

Key lifecycle management policy from CSMS (referencing UNECE R155 Annex 5 Part B)

Secure boot and HSM integration documentation (how key material is protected at rest and boot)

» Evidence: N49014872 - Penetration test or formal assurance report, with test cases focused on key isolation enforcement - (a few paragraphs)

CONCLUSIONS

- We have used this approach to support customers on their type approval journey
  - Practical structured approach
  - Supported by established Assurance Case tooling in ASCE
  - Link the evidence and explain what role it plays

- Come and chat about using an assurance case approach for type approval
  - Poster session on Tuesday afternoon
  - Interactive demo using ASCE

- Contact me or the paper's authors to discuss further

luke.emmet@nccgroup.com

ADELARD
part of nccgroup