Based on the provided security case pattern, here is the instantiated security case for ACAS Xu (Airborne Collision Avoidance System Xu) in a hierarchical tree format:

@Assurance\_case

- G0: ACAS Xu satisfies security requirements

- In context of:

- C0: Description of ACAS Xu

- C1: SR are requirements about protecting ACAS Xu from malicious entities

- J0: The argumentation is based on satisfaction of SRs

- A0: System SRS are complete, adequate, and consistent

- Supported by:

- S0: Argue through asset protection and secure development requirements

- Supported by:

- G1: ACAS Xu satisfies the asset protection requirements

- Assumption:

- A1: Asset inventory is established

- Supported by:

- S1: Argue through the different stages of the system development life cycle

- Supported by:

- G3: Asset protection requirements are met during the architecture design phase

- In context of:

- C2: Description of the ACAS Xu architecture

- Supported by:

- S2: Argue through derivating security threats from SRs

- Justification:

- J1: Detection and mitigation of threats fulfill SRs

- Supported by:

- G5: ACAS Xu architecture is protected against identified security threats (STs)

- Assumption:

- A2: All relevant threats have been identified

- Supported by:

- S3: Argue over each security threat

- Supported by:

- G0.1: ACAS Xu architecture is protected against ST1 (Tampering involving GPS sensors and processor)

- G0.2: ACAS Xu architecture is protected against ST2 (Spoofing involving Sensors and processor)

- G0.3: ACAS Xu architecture is protected against ST3 (Elevation of privileges in the planning system)

- G6: ACAS Xu architecture is validated

- In context of:

- C3: Description of ACAS Xu architecture model

- A3: ACAS Xu architecture model is well defined in formal methods

- G4: Asset protection requirements are met during other phases (undeveloped)

- G2: ACAS Xu satisfies secure development requirements (undevelopstantiated)

@End\_Assurance\_case

This security case structure represents how ACAS Xu satisfies various security requirements by arguing through asset protection and secure development policies, mitigating identified threats, and validating the architecture. Each goal is supported by specific strategies and has relevant contexts, justifications, and assumptions associated with it. The undeveloped and uninstantiated elements (goal G4, G2, G6, and multiple G0.X) indicate areas requiring further development or specific instantiation details.