Here is the derived safety case for the Generic Patient-Controlled Analgesia (GPCA) system instantiated from the provided safety case pattern and represented in a hierarchical tree format using dashes to denote different levels:

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- G1: Operational safety is verified in the GPCA system

- C1: All specs are given by spec.allInstances()

- S1: Argument over the satisfaction of all specs over the GPCA system {Undeveloped}

- G2: All operational hazards are mitigated

- S3: Argument over operational hazards

- C2: Operational hazards are given by operational hazard.allInstances()

- G3: Overinfusion is mitigated

- S4: Argument over the applied scenarios of Overinfusion

- C3: All related scenarios are given by Overinfusion

- G4: Overinfusion is mitigated under Flow rate does not match programmed rate

- S5: Argument over all specs related to Flow rate does not match programmed rate

- C4: All related specs are given by Flow rate does not match programmed rate.spec.allInstances()

- G5: SR1.1 is appropriate for Flow rate does not match programmed rate

- S6: Argument the appropriateness of SR1.1 over properties

- C5: Properties are given by SR1.1.property.allInstances()

- G6: Flow rate sensor is equipped is appropriate for SR1.1

- S7: Argument over the source of the Flow rate sensor is equipped definition

- C6: Source is given by Flow rate sensor is equipped.source

- G7: FDA standard is appropriate and trustworthy

- Sn1: source

- G8: Flow rate sensor is equipped definition is sufficient

- Sn2: property

- G3: Underinfusion is mitigated

- S4: Argument over the applied scenarios of Underinfusion

- C3: All related scenarios are given by Underinfusion

- G4: Underinfusion is mitigated under Flow rate is less than 90% of the programmed rate setting

- S5: Argument over all specs related to Flow rate is less than 90% of the programmed rate setting

- C4: All related specs are given by Flow rate is less than 90% of the programmed rate setting.spec.allInstances()

- G5: SR6.1.3 is appropriate for Flow rate is less than 90% of the programmed rate setting

- S6: Argument the appropriateness of SR6.1.3 over properties

- C5: Properties are given by SR6.1.3.property.allInstances()

- G6: Period (to trigger the underinfusion alarm) is 15 minutes is appropriate for SR6.1.3

- S7: Argument over the source of the Period (to trigger the underinfusion alarm) is 15 minutes definition

- C6: Source is given by Period (to trigger the underinfusion alarm) is 15 minutes.source

- G7: Expert opinion is appropriate and trustworthy

- Sn1: source

- G8: Period (to trigger the underinfusion alarm) is 15 minutes definition is sufficient

- Sn2: property

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This safety case has been instantiated by removing placeholders and filling in concrete details specific to the GPCA system. Elements marked with "{Undeveloped}" indicate parts of the argument that are identified as needing further detail or development.