Based on the safety case pattern provided for the GPCA system, I will instantiate this pattern to create a safety case aligned with the specific domain information on operational hazards of overinfusion and underinfusion, focusing on the safety requirements to mitigate these hazards. The hierarchical tree of the instantiated safety case is displayed using dashes (-) to denote different levels.

\*\*Safety Case for GPCA System\*\*

- \*\*Goal G1: Operational safety is verified in GPCA system\*\*

- \*\*Strategy S1: Argument over the satisfaction of all specs over GPCA system\*\* (undeveloped)

- \*\*Goal G2: All operational hazards are mitigated\*\*

- \*\*Strategy S3: Argument over operational hazards\*\*

- \*\*Goal G3: Overinfusion is mitigated\*\*

- \*\*Strategy S4: Argument over the applied scenarios of Overinfusion\*\*

- \*\*Goal G4: Overinfusion is mitigated under excessive bolus requests scenario\*\*

- \*\*Strategy S5: Argument over all specs related to excessive bolus requests\*\*

- \*\*Goal G5: Dose limit exceeded due to excessive bolus requests is appropriate for excessive bolus requests\*\*

- \*\*Strategy S6: Argument the appropriateness of dose limit spec over properties\*\*

- \*\*Goal G6: Flow rate sensor is equipped is appropriate for dose limit spec\*\*

- \*\*Strategy S7: Argument over the source of the property definition\*\*

- \*\*Goal G7: Source (FDA standard) is appropriate and trustworthy\*\*

- \*\*Solution Sn1: FDA standard document reference\*\*

- \*\*Goal G8: Property definition (Flow rate sensor is equipped) is sufficient\*\*

- \*\*Solution Sn2: Engineering calculations and design documents\*\*

- \*\*Context C2: Operational hazards (Overinfusion)\*\*

- \*\*Context C3: All related scenarios (Excessive bolus requests)\*\*

- \*\*Strategy S2: Argument over reliability in all suitable levels of GPCA system\*\* (undeveloped)

- \*\*Context C1: All specs (including dose limit, flow rate sensor equipped)\*\*

Each level of abstraction in the safety case corresponds to the level of detail provided about different components, strategies, and contextual information ensuring the mitigation of hazardous situations in the GPCA system, focusing on the logical structure derived from the generic safety case pattern provided. The placeholders in the pattern are instantiated with specific elements, operational hazards, scenarios, safety requirements, properties, and sources derived from the domain-specific information provided.