To create an assurance case for the BlueROV2 system based on the provided assurance case pattern, I will replace the placeholders with system-specific information and resolve the pedigree of the structure. Below is the instantiated hierarchy:

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G1: Hazards for BlueROV2 system addressed in accordance with ALARP principle.

- S1: Argument by risk reduction/elimination of each hazard

- G2: No intolerable risks present in the system.

- C1: Definition of "intolerable" risks as those that cannot be reduced or accepted by system use norms.

- S2: Argue that risk posed by any remaining hazards is negligible. (undeveloped)

- S3: Argue that no other risks have been identified. (undeveloped)

- G3: Risk from collision hazard has been reduced as low as reasonably practicable.

- C2: Assigned severity class is high for collision hazard.

- S4: Apply ReSonAte to estimate level of risk from collision hazard.

- A1: Navigation and obstacle detection functions required for autonomy model are available.

- G4: Model BlueROV2 autonomy BTD accurately describes possible propagation of collision hazard.

- G6: Possible hazard propagation paths correctly captured in BTD. (undeveloped)

- G7: Barriers in the BTD correctly describe their respective control action including any required system functions. (undeveloped)

- G8: All non-negligible threats have been identified. (undeveloped)

- G5: Quantitative risk estimates are accurate and below acceptable threshold

- G9: State probability distribution used for risk estimation is an accurate representation of expected system states. (undeveloped)

- G10: Estimated probability of system failure is below allowable threshold for severity class.

- Sn1: Estimated risk level is assessed to be 0.1% per operational hour.

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\*\*Explanation:\*\*

- \*\*G1\*\* (top-level goal): Addresses that all hazards for the BlueROV2 system have been managed according to the ALARP principle. The strategy (S1) supporting G1 involves reducing or eliminating the risks from each identified hazard.

- \*\*S1\*\* supports multiple goals: \*\*G2\*\* (ensuring no intolerable risks are present) which is further developed through strategies S2 (showing negligible risks remain - undeveloped) and S3 (indicating that no further risks identified - undeveloped); \*\*G3\*\* (demonstrating specific risk reduction) which is expounded using strategy S4.

- \*\*S4\*\* argues the risk estimation from a collision hazard scenario using the ReSonAte framework and is conditioned on the availability of specific functions (A1), like navigation and collision detection.

- \*\*G4\*\* and \*\*G5\*\*: Operational and system-level goals linked to models and quantitative risk assessments.

- \*\*G6\*\*, \*\*G7\*\*, \*\*G8\*\*, and \*\*G9\*\*: Reflects finer system-level details about modeling and threat identification, some of which remain undeveloped.

- \*\*Sn1\*\*: Provides specific numeric evidence supporting the risk level being below an acceptable threshold.

This instantiation clearly replaces placeholder terms with concrete ones specific to the BlueROV2 system while addressing some elements as undeveloped, indicating areas where further development is needed.