Below is the Safety Assurance Case for the BlueROV2 system based on the given assurance case pattern for reducing hazards according to the ALARP principle. The hierarchical tree format is as follows:

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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"

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 "Obstacle encounter" hazard has been reduced as low as reasonably practicable.

C2: Assigned severity class is Major

S4: Apply ReSonAte to estimate level of risk from hazard condition "Obstacle encounter"

A1: Function "obstacle detection" required by the obstacle encounter BTD is available

G4: Model "obstacle encounter BTD" accurately describes possible propagation of hazard "Obstacle encounter" (uninstantiated)

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 "collision" is below allowable threshold for severity class

Sn1: Estimated risk level 10^-3 per hour

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In this hierarchical structure:

- The top-level goal (G1) asserts that hazards for the BlueROV2 system are addressed following the ALARP principle.

- A strategy (S1) supports G1 through risk reduction or elimination arguments for each hazard.

- G2 and G3 are derived from S1. G2 is supported by the context C1 and two strategies, S2 and S3, which are currently undeveloped.

- G3 is the claim that risk from the specific hazard "Obstacle encounter" has been reduced ALARP, supported by the context C2.

- S4 is the strategy to estimate risk levels using ReSonAte, in the context of function "obstacle detection" and its presence required by the BTD, supported by the assumption A1.

- G4 and G5 derive from S4, although G4 is currently uninstantiated.

- G5 leads to G9 (undeveloped) and G10, which is supported by Sn1 demonstrating the estimated risk level of collision.

This structure provides a clear, organized approach to demonstrating how the BlueROV2 system's safety risks are managed, identifying areas where further development and instantiation are needed.