Here's the assurance case for the BlueROV2 system in a hierarchical tree format:

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- G1: Hazards for the 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 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 avoidance logic required by Obstacle encounter BTD is available

- G4: Model Obstacle encounter BTD accurately describes possible propagation of hazard obstacle encounter

- 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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### Notes:

1. \*\*Placeholders:\*\* All placeholders (e.g., {A:: System}, {B:: Hazard}, etc.) are replaced with specific information related to the BlueROV2 system's hazards and models.

2. \*\*Uninstantiated and Undeveloped Elements:\*\* Elements marked as uninstantiated or undeveloped are indicated in brackets at the respective levels.

3. \*\*Assumptions and Contexts:\*\* Contexts and assumptions are inserted at the appropriate levels to establish the foundational support and clarify the terms used within the goals and strategies.

This hierarchical structure ensures that each component of the assurance case for the BlueROV2 system is addressed in accordance with the provided pattern and domain information.