To create the assurance case for the BlueROV2 system based on the given assurance case pattern, we must instantiate the placeholders in the pattern using specific elements derived from domain information:

@Assurance\_case

- \*\*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: Intolerable = Risk beyond acceptable threshold determined by safety standards.\*\*

- \*\*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: Severity class is Major (as assigned for obstacle encounter hazard).\*\*

- \*\*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 the severity class Major.\*\*

- \*\*Sn1: Estimated risk level is 10^-3 per hour (collision risk level as specified in the obstacle encounter BTD).\*\*

This template provides a structured view of the assurance case elements, strategies, contexts, assumptions, solutions, and their hierarchical and contextual connections based on the predicate rules. Each undeveloped or uninstantiated element must further develop and substantiate to complete and strengthen the case.