Below is the instantiated assurance case for the BlueROV2 system, displayed in a hierarchical tree format using dashes (-) to denote different levels. Note that any undeveloped and uninstantiated elements have been highlighted with notes indicating their status.

\*\*Hierarchical Tree for BlueROV2 Assurance Case:\*\*

- \*\*G1: Hazards for BlueROV2 system addressed in accordance with ALARP principle. (undeveloped/ uninstantiated)\*\*

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

- \*\*G2: No intolerable risks present in the system.\*\*

- \*\*C1: Definition of "intolerable"\*\*

- \*\*S2: {Argument by showing no intolerable risks present in the system} (undeveloped)\*\*

- \*\*S3: {Argument by showing any remaining hazards pose negligible risk} (undeveloped)\*\*

- \*\*G3: Risk from {Hazard} has been reduced as low as reasonably practicable\*\*

- \*\*C2: Assigned severity class is {Hazard.Severity} (uninstantiated)\*\*

- \*\*S4: Apply ReSonAte to estimate level of risk from hazard condition {Hazard}\*\*

- \*\*A1: Function {Function} required by {BTD} is available (uninstantiated)\*\*

- \*\*G4: Model {BTD} accurately describes possible propagation of hazard {Hazard} (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 {Consequence} is below allowable threshold for severity class (uninstantiated)\*\*

- \*\*Sn1: Estimated risk level is {attr:RiskEst} (uninstantiated)\*\*

As per the assurance case pattern, generic placeholders need instantiation with specific information relevant to the BlueROV2 system. For instance:

- Replace `{System}` in G1 with "BlueROV2 system".

- Replace `{Hazard}` in G3 and G4 with specific hazards identified for the BlueROV2 system.

- Replace `{BTD}` in G4 with specifics of the BlueROV2’s Barrier and Threat Diagram (BTD).

- Replace `{Function}` in A1 with specific required functions identified in the BTD.

- Replace `{Hazard.Severity}` in C2 with the assigned hazard severity class for specific hazards.

- Replace `{Consequence}` in G10 with the consequential impact values observed for BlueROV2 system operations.

- Replace `{attr:RiskEst}` in Sn1 with the specific risk estimation attributes measured for BlueROV2.

By completing these replacements and developing the undeveloped goals (e.g., G6, G7, G8, G9), the assurance case for the BlueROV2 system would be fully instantiated and developed.