Based on the provided predicates for an assurance case pattern, the hierarchical tree structure for the BlueROV2 system's assurance case can be outlined as follows, where "BTD" refers to Bow-Tie Diagram, "System" is replaced with "BlueROV2", and placeholders are instantiated:

- \*\*Goal (G1, Hazards for BlueROV2 addressed in accordance with ALARP principle.)\*\*

- \*\*Strategy (S1, Argument by risk reduction/elimination of each hazard)\*\*

- \*\*Goal (G2, No intolerable risks present in the system.)\*\*

- \*\*Strategy (S2, Argue that risk posed by any remaining hazards is negligible)\*\* [Undeveloped]

- \*\*Strategy (S3, Argue that no other risks have been identified)\*\* [Undeveloped]

- \*\*Context (C1, Definition of "intolerable")\*\*

- \*\*Goal (G3, Risk from specific hazard has been reduced as low as reasonably practicable)\*\*

- \*\*Strategy (S4, Apply ReSonAte to estimate level of risk from hazard condition specific hazard)\*\*

- \*\*Goal (G4, Model BTD accurately describes possible propagation of specific hazard)\*\*

- \*\*Goal (G6, Possible hazard propagation paths correctly captured in BTD)\*\* [Undeveloped]

- \*\*Goal (G7, Barriers in the BTD correctly describe their respective control action including any required system functions)\*\* [Undeveloped]

- \*\*Goal (G8, All non-negligible threats have been identified)\*\* [Undeveloped]

- \*\*Goal (G5, Quantitative risk estimates are accurate and below acceptable threshold)\*\*

- \*\*Goal (G9, State probability distribution used for risk estimation is an accurate representation of expected system states)\*\* [Undeveloped]

- \*\*Goal (G10, Estimated probability of specific consequence is below allowable threshold for severity class)\*\*

- \*\*Solution (Sn1, Estimated risk level specific attribute:RiskEst)\*\*

- \*\*Context (C2, Assigned severity class is specific hazard severity)\*\* [Uninstantiated]

- \*\*Assumption (A1, Function required by BTD is available)\*\* [Uninstantiated]

This hierarchial structure defines how the top-level goal (G1) concerning hazard management in accordance with the ALARP principle is supported by a strategy (S1) that branches into more specific goals (G2, G3). Each sub-goal is further developed or linked to deeper strategies and lower level goals, with assumptions, contexts, and solutions providing critical supporting details. It also illustrates undeveloped and uninstantiated components that require further expansion in a fully detailed assurance case.