Below is the instantiated assurance case for the BlueROV2 system, following the given assurance case pattern. I've replaced placeholders with specific information relevant to the BlueROV2 and removed unnecessary decorators.

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- 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.)

- Context (C1, Definition of "intolerable")

- Strategy (S2, Argue that risk posed by any remaining hazards is negligible)

- [Undeveloped]

- Strategy (S3, Argue that no other risks have been identified)

- [Undeveloped]

- Goal (G3, Risk from underwater collision hazard has been reduced as low as reasonably practicable)

- Context (C2, Assigned severity class is High)

- Strategy (S4, Apply ReSonAte to estimate level of risk from hazard condition underwater collision hazard)

- Assumption (A1, Function Obstacle Avoidance required by System BTD is available)

- Goal (G4, Model System BTD accurately describes possible propagation of hazard underwater collision 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 severe underwater equipment damage is below allowable threshold for severity class)

- Solution (Sn1, Estimated risk level consistent with quantified data)

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### Explanation:

1. \*\*Top-Level Goal (G1):\*\* This is the overarching goal, claiming that hazards for BlueROV2 have been addressed in accordance with the ALARP (As Low As Reasonably Practicable) principle.

2. \*\*Strategy (S1):\*\* This strategy argues that the risk has been reduced or eliminated for each hazard by breaking it down further:

- \*\*Goal (G2):\*\* Makes the claim that no intolerable risks are present in the system, and is supported by:

- Context (C1): Defines what is meant by "intolerable."

- \*\*Strategy (S2) and (S3):\*\* Two different strategies to argue the absence of intolerable risks, but currently underdeveloped.

- \*\*Goal (G3):\*\* Focuses on a specific hazard, in this case, an underwater collision, and claims risk is reduced to ALARP. It is supported by:

- Context (C2): Specifies that the assigned severity class for this hazard is high.

- \*\*Strategy (S4):\*\* Uses the ReSonAte tool/methodology to estimate the risk level, and is supported by:

- Assumption (A1): Assumes that the function "Obstacle Avoidance" required by the system BTD (Barrier Tight Design) is available.

- \*\*Goal (G4):\*\* Ensures that the System BTD accurately describes possible propagation paths of the underwater collision hazard, supported by:

- \*\*Goal (G6, G7, G8):\*\* Further captures various aspects of hazard propagation and control actions, but are currently underdeveloped.

- \*\*Goal (G5):\*\* Aims to prove that the risk estimates are accurate and below the acceptable threshold, supported by:

- \*\*Goal (G9):\*\* About the state probability distribution used for risk estimation, but is currently underdeveloped.

- \*\*Goal (G10):\*\* Ensures that the estimated probability of severe underwater equipment damage is below the allowable threshold, supported by:

- Solution (Sn1): Provides quantified data as evidence for estimated risk levels.

### Uninstantiation and Development:

- I've completed the specific instantiation related to BlueROV2 wherever applicable and removed the placeholders.

- Elements marked as [Undeveloped] indicate that further development is required to fully flesh out those parts of the assurance case.