

## 1.2 Customer Needs

### Statement Gathering:

Statement gathering was done via meeting with our project sponsor, Richard Ahl, via Zoom. During this meeting the team asked a series of questions and recorded his responses to be interpreted for use during our project. The team questioned him about the various technical aspects of the project as well as the parameters that the team should work within. We also requested data pertaining to the project. With these statements taken into consideration, we crafted need statements and a plan on how to address those needs.

### Customer Statements & Interpreted Needs:

After speaking with Richard and asking a series of questions, we gained background knowledge necessary to begin this project as well as helpful clues to identify the scope of this project. We acknowledged the customer needs and interpreted them, thus figuring out what is needed to fill those needs. Below is a summary of the questions, customer statements, and interpreted needs. Reference Appendix A-1 for a table with all questions and answers.

Q: What are your objectives for this project?

A: Weight reduction for hardtop assembly and improvements on shape and aerodynamics.

**N: The new hardtop will improve boat performance.**

The above question directly addresses the key goals of this project, and spurs further thinking on the matter. Richard expressed that Intrepid is always looking for ways to increase boat performance, top speed, efficiency, and quality engineering and reducing hardtop weight while improving aerodynamic ability of the hardtop is one area of improvement. Therefore, the improved hardtop will be lighter and more aerodynamic.

Q: What materials need to be considered?

A: Consider materials already being used by Intrepid.

**N: The improved hardtop will incorporate materials used within Intrepid's manufacturing constraints.**

The above question helps narrow the scope of the project regarding what to consider during material changes within the project itself. Keeping the materials the same as currently used within Intrepid will help reduce cost during implementation of our solution while keeping the improved hardtop within Intrepid's manufacturing capabilities.

Q: What are the parameters of the current hardtop models in use?

A: Current parameters can be considered through further analysis of the cad model and software highlighted.

**N: The improved hardtop dimensions will be similar to the current hardtop dimensions.**

This question and the gathered statement shed light on the customers need for us to stay within current hardtop design parameters. This is important for cost and time saving needs and allows the changes to be implemented within current Intrepid models.

Q: Can we alter the wire/chase tubes layout?

A: The layout can be altered if exit points for the wires are kept the same.

**N: The improved hardtop may alter the wire layout while retaining exit points.**

This question addresses the topic of if we can make changes to wire/chase tubes in order to accomplish the customer's needs. While we can make changes to the layout, the wires exit points will remain where they are. Therefore, the improved hardtop will retain exit points even if changes occur.

Q: Do you want a generic hardtop, or a design for a specific boat?

A: Use Intrepid 409 Valor hardtop as reference, it is very large and is the best supported hardtop we have. Use it to derive a new design.

**N: The improved design will be made for the Intrepid 409 Valor.**

This question provides the team with additional parameters when it comes to design. The Intrepid 409 Valor has the largest and most well supported hardtop and this will allow us to make changes that can be applied to other hardtops throughout their fleet.

Q: Is there a certain weight that the hardtop needs to be able to withstand?

A: The weight/force of aerodynamic forces and support service techs who stand on top.

**N: The improved design will withstand nominal running conditions and loading conditions including a factor of safety.**

This provides additional parameters to work within. The changes to the hardtop need to be able to support the aerodynamic forces that are needed and support a serviceperson who will be working on the boat. This allows for additional analysis because of the parameters given by Intrepid.

### **Explanation of Results:**

From what Intrepid gave us, functions we need to focus on are the weight, the shape, the materials, and the design. We started by gathering our statements from our sponsor during our initial meeting. We generated questions to ask during this meeting for use in developing our customer needs. The key takeaway is that we need to focus on light weighting the hardtop while increasing the aerodynamic properties of the hardtop. These changes need to be considered with the new design while retaining manufacturability, keeping cost to a minimum, and staying true to Intrepid's styling and quality.