FAMU - FSU COLLEGE OF ENGINEERING

Senior Design Team 310

*Professor:* DR. Hooker & DR. McConomy



Customer Needs



*Authors:*

Denis Dineen

Jacob Hutto

Hunter Kramer

Doran McFalls

Nicolas Palmeiro

*Date:*

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Customer Needs

The initial meeting with our sponsor liaison – Giovanni Herazo of Florida Power & Light – concluded with the understanding that our team would develop a device to allow telerobotic maintenance of power lines. Throughout additional sessions, our team was able to obtain the following statements regarding various desires of the intended customer (Florida Power & Light). We performed technical translations of these statements to better focus the overall scope of our project. Table 1 lists the questions, responses, and interpretations we gathered as a result of these sponsor meetings.

Table 1: Interpreted Customer Needs

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| **Question Number** | **Question/Prompt** | **Customer Response** | **Interpreted Need** |
| 1. | What is your vision for this project? | Our goal is to develop a telerobotic Line Worker system to perform installations and maintenance on power lines. | Device can perform basic power line repairs. |
| 2. | Will the device operate on transmission and/or distribution power lines? | The initial concept will be to deploy on distribution lines, but if we can make it work for both applications would be great as well. | Device can reach height of power lines. |
| 3. | How long will the device be in operation on a daily basis? | I would expect the robot to operate 6-8 hours of continuous use. In the future I expect the telerobotic system to be integrated with the onboard electronics of the boom truck to reduce weight and additional maintenance of battery systems. | Device relies on power source capable of extended use. |
| 4. | What are the biggest hazards/risks in a lineman’s job? | The biggest hazard for a lineman is working next to energized power lines. | Device increases distance between line worker and energized line. |
| Working in extreme heat can cause dehydration and overheating. | Device operates normally within severe heat conditions. |
| 5. | What PPE (Personal Protection Equipment) is required by FPL for linemen? | FPL linemen are required to wear a hard hat, FR (fire rated) shirt, safety glasses, 17KV gloves, leather gloves and steel toe shoes. | Device can operate with a high voltage. |
| 6. | How do you ensure that linemen will follow safety protocols? | We have an LJASC committee...full review is done in the event of [safety] violation. | Device records action while in operation. Recordings can be accessed at a later point in time. |
| 7. | Would you want the device to operate during inclement weather? | We typically limit our crews to not work when winds are over 35mph. In the future if we have a fully autonomous robot than can operate in any weather conditions would be great! | Device can withstand high wind speeds. |
| 8. | What components are routinely replaced? What is the frequency of these replacements? | Hardware that is typically replaced during maintenance are Lightning Arrestors, Insulators, Splices, etc. | Device can manipulate objects of various size, weight, and shape. |
| 9. | How many bucket trucks does FPL send out for these tasks? We often see two or more. | There are typically between one and two trucks per pole location. | Device can be maneuvered by differing sized work teams. |
| 10. | Can maintenance work be performed during any time of day? | Yes, our crews currently operate 24/7. | Device can be operational during day or night. |
| 11. | Will it be used for regular maintenance work or special occasions? | I would expect the telerobotic system to be used for emergency restoration and construction work on our power lines. | Device contains short set up time. |
|  | Device relies on power source independent of grid. |
| 12. | Will the device be personalized for strictly FPL standards? | Correct, the goal will be to use for FPL operations. | Device adheres to all company standards. |