



Release Lanyard Project

November 7th 2012

Team 5

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Overview

- ▶ Problem Statement
- ▶ Current Design
- ▶ Design Analysis
- ▶ Top Designs
- ▶ Gantt Chart
- ▶ Conclusion
- ▶ References

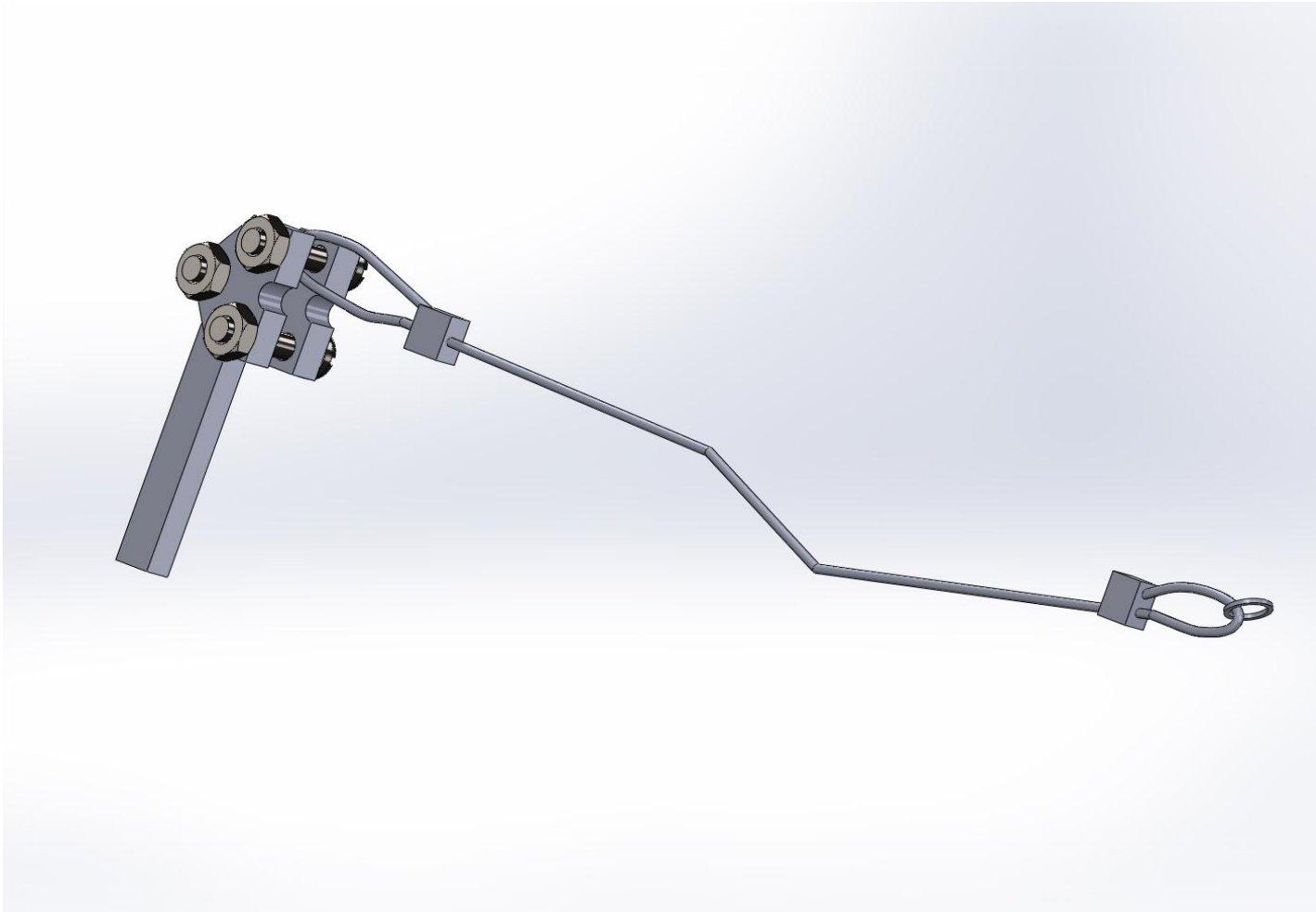
Problem Statement

- ▶ Issues with freezing temperatures and debris
- ▶ Issues not activating weapons system
- ▶ Issues with poor installation

General Constraints

- ▶ Temperature Range -50°C to 150°C
- ▶ Activation Force of 50N
- ▶ Breaking force of linkage 75N

Current Lanyard Design



Design Analysis

- ▶ Mechanics of Material
- ▶ Material Science
- ▶ Vibration
- ▶ Fluid Mechanics
- ▶ Heat Transfer
- ▶ Manufacturing

Design Areas

- ▶ Cable Guide Components
- ▶ Cable Options
- ▶ Activation System

Design Ideas

- ▶ DuPont™ Krytox® Lubricants
- ▶ Wide Temperature Range: $-70\text{ }^{\circ}\text{C}$ to $399\text{ }^{\circ}\text{C}$
- ▶ Suborbital, orbital, deep space flight, commercial, corporate and military aviation applications

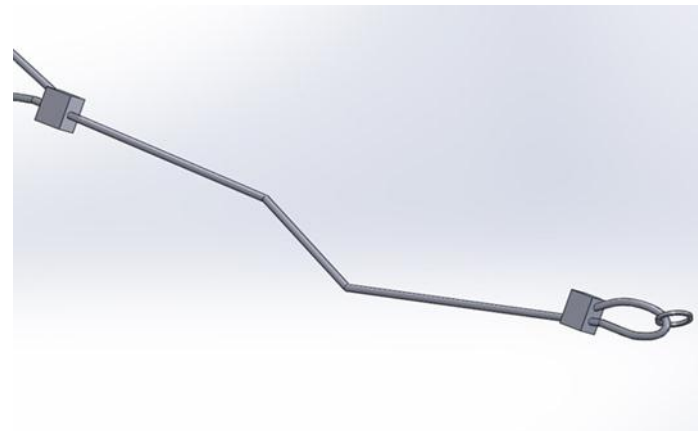
Design Ideas

- ▶ Cap for Guide Pipe
 - Required Temp. range -50 to 150°C
- ▶ Fluorosilicone Rubbers
 - Temp. range -74 to 175°C
- ▶ Silicone
 - Temp. range -60 to 200°C



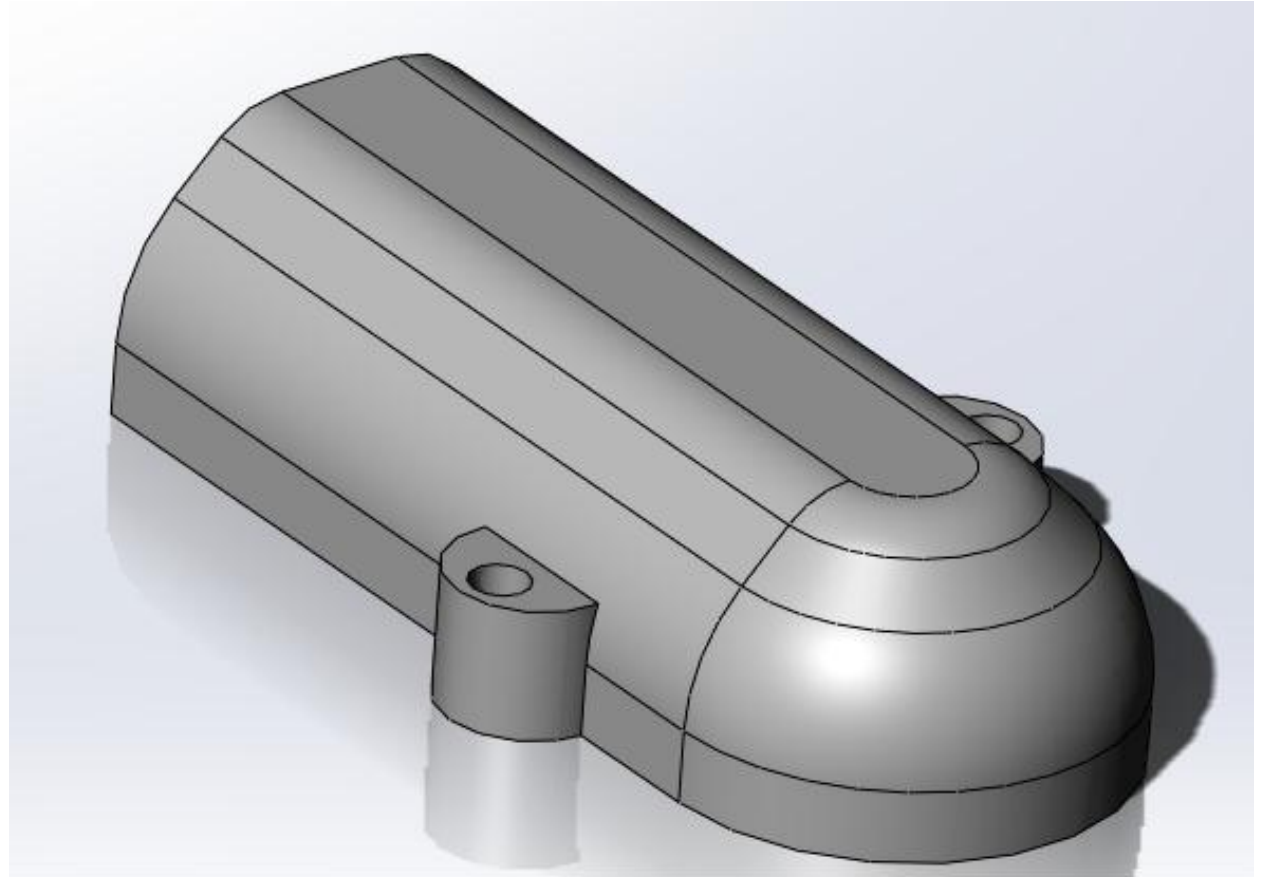
Design Ideas

- ▶ Cable Coatings
 - Required Temp. Range of -50 to 150°C
- ▶ Tyvek Wrap
 - Temp. Range of -73 to 135°C
- ▶ Teflon Wrap
 - -73 to 204°C



Top Design

- ▶ Housing

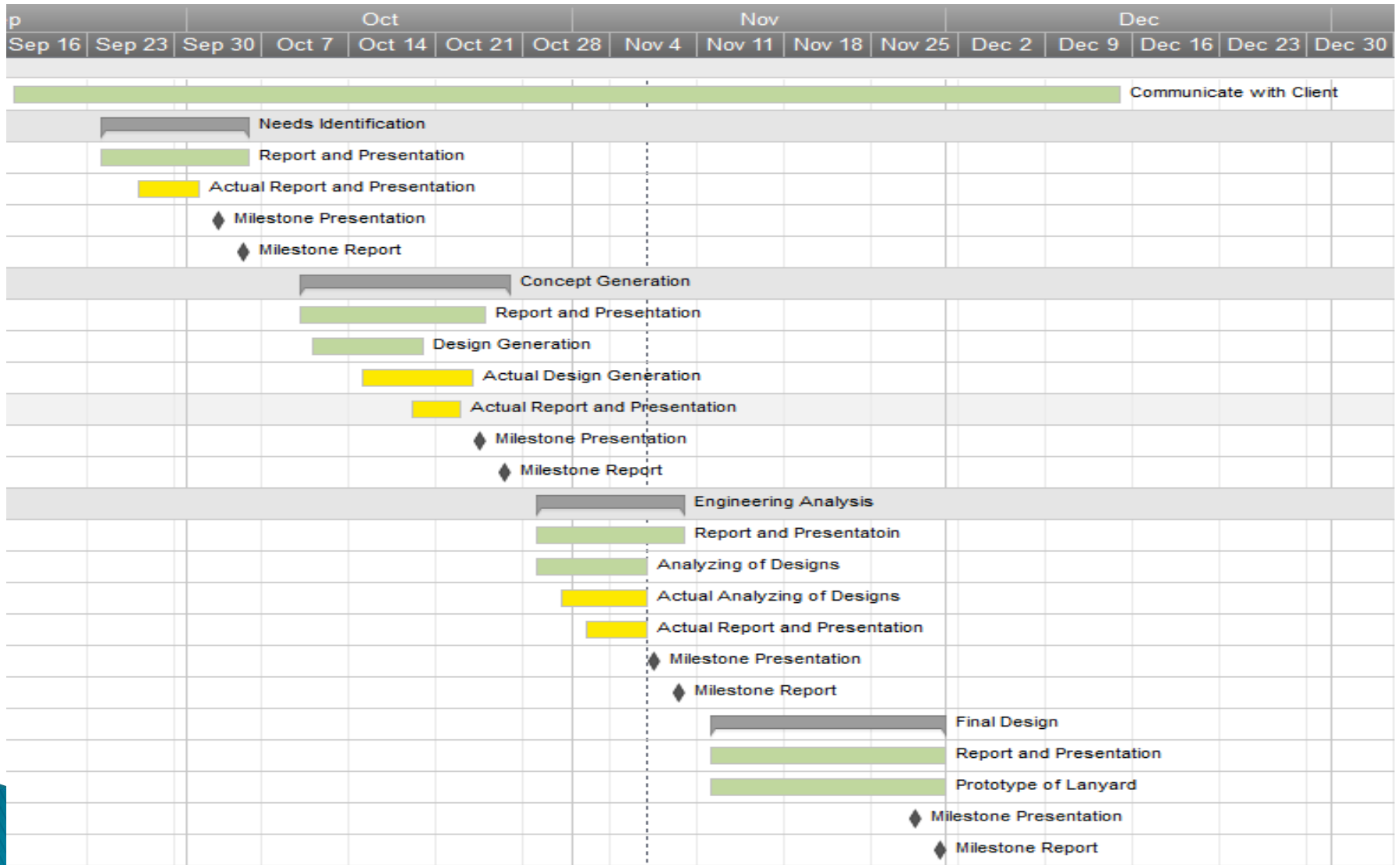


Top Design

- ▶ Servos



Gantt Chart



Conclusion

- ▶ Problem Statement
- ▶ Current Design
- ▶ Design Analysis
- ▶ New Design Area of Focus
- ▶ Top Designs
- ▶ Gantt Chart

References

▶ Stephen Larimore

- Raytheon Department Manager

▶ Kelly Convington

- Raytheon Mechanical Engineer

▶ Internet

- <http://www.ahpseals.com/tech/materials.php>
- <http://www.materialconcepts.com/products/tyvek/sheets/>
- http://www.boedeker.com/teflon_p.htm
- http://www2.dupont.com/Lubricants/en_US/industries/Aerospace_Industry.html

Questions?