



Northrop Grumman



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Company Background

Northrop Grumman is a leading technology provider for the United States and their allies with sectors in aeronautics, space, and defense, and mission systems. The Elk River location has about 65 employees and is a part of the defense systems sector. Elk River is a primary location for armament development, assembly and testing, and is the nation's largest privately owned proving grounds.



“Working with Northrop Grumman was a very rewarding experience as many people on site were excited about the project and were eager to help along the way. This program was a great opportunity to apply the engineering approach to the real world and to see how driving for sustainability can have a huge impact.”~ AF

Project Background

Northrop Grumman’s corporate headquarters has been emphasizing sustainability in recent years. By 2020, Northrop Grumman sought to reduce their greenhouse gas emissions by 30% and divert 70% of their solid waste. As of 2020, the greenhouse gas emissions were reduced by 43% and the solid waste diverted at a rate of 69%. With new goals for 2030 on the way, Northrop Grumman was interested in waste and greenhouse gas emissions reduction projects with MnTAP to further reduce their impact on the environment.

Solid waste reduction and energy efficiency opportunities have been explored. An area of potential waste reduction had been previously identified in the ammunition soft catch testing area. This process area requires significant manpower to conduct testing and follow up retrieval of projectiles. It generates a large amount of solid waste and is increasing in cost due to raw material supply limits. Numerous alternatives have been considered in the past, however, none of these options met all the process needs. Turning to energy use, both a lighting audit and a compressed air assessment were conducted to determine if there were additional opportunities to capture.

Incentives To Change

The primary motivations in pursuing this intern project were to reduce waste and greenhouse gas emissions. Northrop Grumman set substantial companywide sustainability goals and felt the Elk River site had large opportunity due to the size and age of the facilities as well as the increasing demand for ammunition testing. Northrop Grumman welcomed any additional benefits arising from this work such as an operating cost reduction and improved safety for hazardous operations.

SOLUTIONS

Reusable Target Materials

An area of potential waste reduction was identified in the ammunition testing area. Currently, target material is used to catch the projectiles from the tests for further analysis. This process currently utilizes large bundles of fiberboard sheet to safely catch the projectiles and a significant amount of manpower is required retrieve them after each

Solutions



Optimize Compressed Air Systems

Compressed air systems can be one of the most expensive power sources in many manufacturing buildings. Installing smaller air compressors for HVAC control in explosive operations buildings and following best practices allows for the larger compressed air system to be turned off after operating hours and optimizes the compressed air system. This could save Northrop Grumman 131,000 kWh and \$20,600 annually with additional benefits of less emergency maintenance on compressed air systems.

test. Along with producing nearly 340,000 lbs of solid waste annually, the current testing process has increased in price over the years. It is recommended to replace fiberboard target material with industrial sized bags of crumb rubber for this testing area. This process change would also implement a material handling device to retrieve the projectiles as well as collect and reuse the crumb rubber material for future testing. This solution could save Northrop Grumman \$154,000 while eliminating 340,000 lbs of solid waste annually.

Update Lighting Fixtures

Energy efficiency projects such as LED lighting retrofits have been launched successfully in the past. There were several additional lighting opportunities identified over the course of this work. A lighting audit was performed in 10 building areas to assess the type of lighting in place and the quality of light delivered to the respective work areas. By updating the light fixtures, Northrop Grumman has the potential to save 57,000 kWh and \$9,000 annually while the quality of lighting for work tasks will improve.



Recommendation	Annual Reduction	Annual Savings	Status
Rubber Mulch Target Material	340,000 lbs	\$154,000	Recommended
LED Lighting Retrofit	57,000 kWh	\$9,000	In Progress
Updating Air Compressor Systems	131,000 kWh	\$20,600	Recommended

MnTAP Advisor: Michelle Gage, Engineer