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ABSTRACT

An increase presence of US Navy ships is required in the Pacific Theater to maintain stability in the region. The increase of operating time at sea for the ships increases the time required for maintenance and repairs needed to keep them in the fight. Improvements of maintenance procedures and repair scheduling by emphasizing the “Critical Path” were proposed and discussed with both the Ship’s Force and Production Facilities in an attempt to perform more routine maintenance at sea by the Ship’s Force and streamline the maintenance that is performed while in port. The procedure and scheduling improvements had mixed results as around half of all proposed improvements were feasible in the time allotted and/or current personnel capabilities. Overall, the improvements that were possible will have a positive impact on the force projection presence in the Pacific theater by improving the areas maintenance facility, Ship Repair Facility, in Yokosuka, Japan.

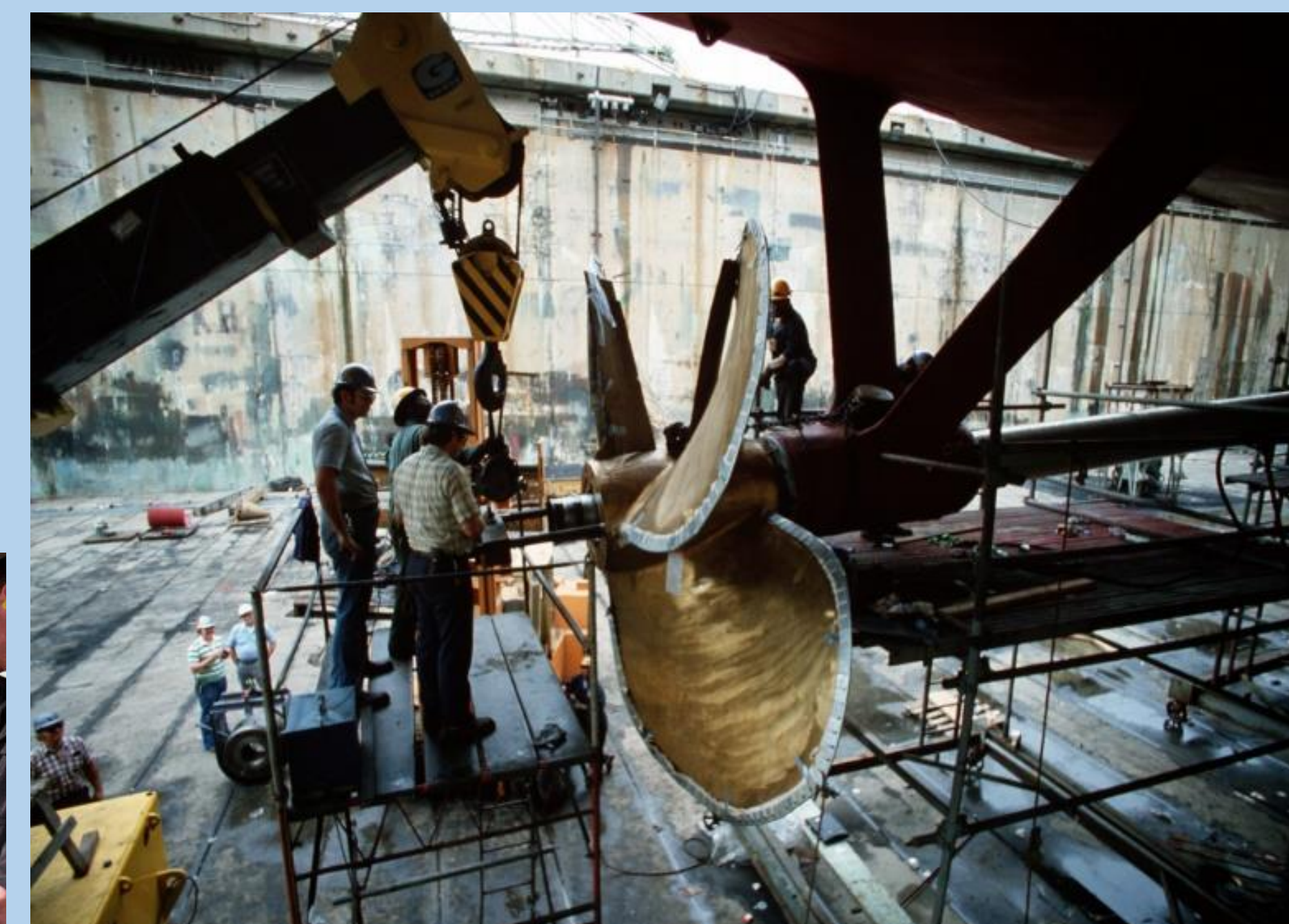


PROBLEM

Recently the US Navy has determined that an increase presence for the 7th Fleet is necessary in the Pacific Theater. This is due to increase aggression and presence during recent years from regional nations that the United States considers adversaries. Examples of these are North Korea’s increase in testing of long-range missiles and nuclear weapons; China’s aggressive expansion into the sea region in between China and Japan, even going so far as to make man-made islands and constructing airfields in them; and Russia annexation of Crimea and increase military presence in the skies in Europe. To have an increase force projection in the area, more US Navy ships need to operate in the area or the current ships that are present need to be out at sea for longer periods of time. Increasing the number of ships available by construction would take too long, not to mention expensive. Bringing ships from other parts of the world would decrease the US presence in other points of interest. The only option would be to increase the amount the ships that are out at sea, which increases the amount of maintenance and repairs that are required to keep this ships operating.

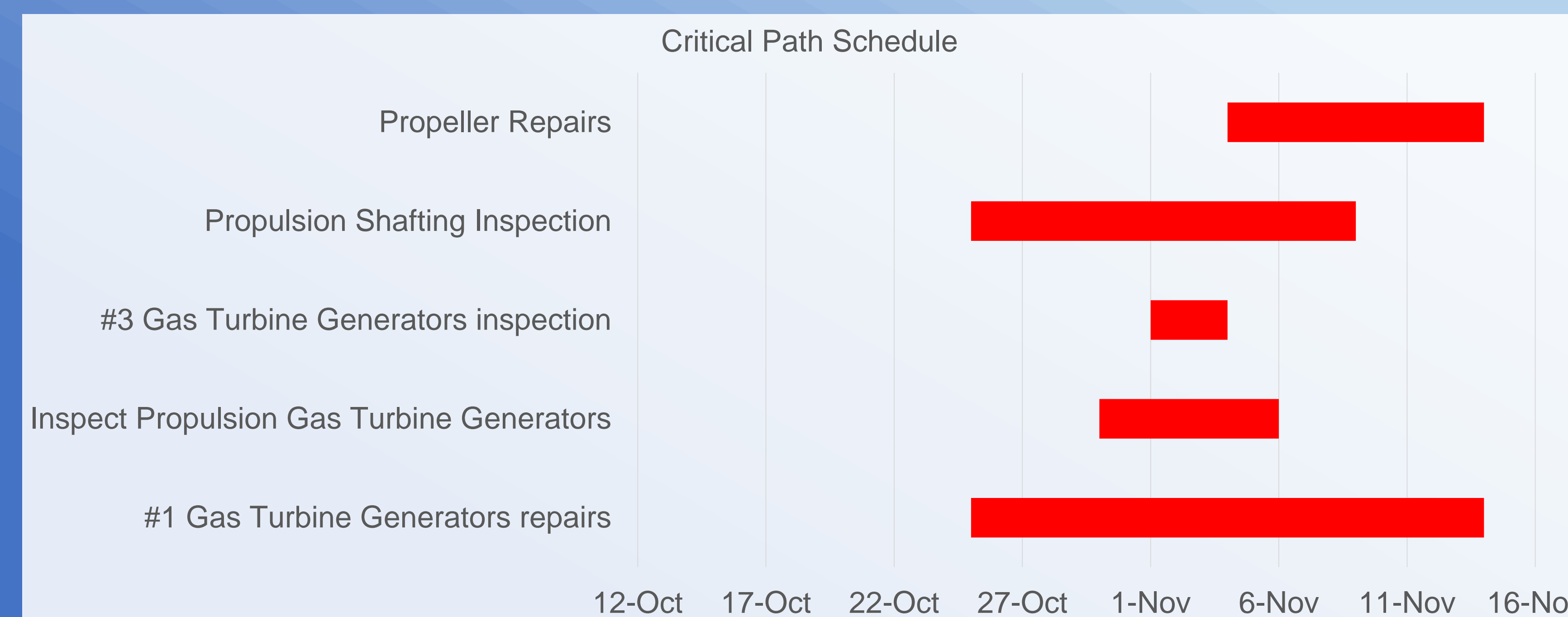
METHODOLOGY

The approach used in choosing the procedures for improvements was based on the impact that each procedure would make on the overall project [1]. The procedure had to be of enough consequence, either in difficulty or time required to actually make a difference in the overall time required to complete a maintenance and repair availability. Thou the focus was turned to procedures dealing with the ship’s hull, engines and vital system as they are the most labor and time intensive jobs that are undertaken while in port. The use of more specialist training, preparation work by Ship’s Force while at sea and breaking down the procedures in sections that can be accomplished separately would allow more flexibility on the way we performed them. The theory is that this would allow the procedures take less time with more involvements from Ship’s Force.

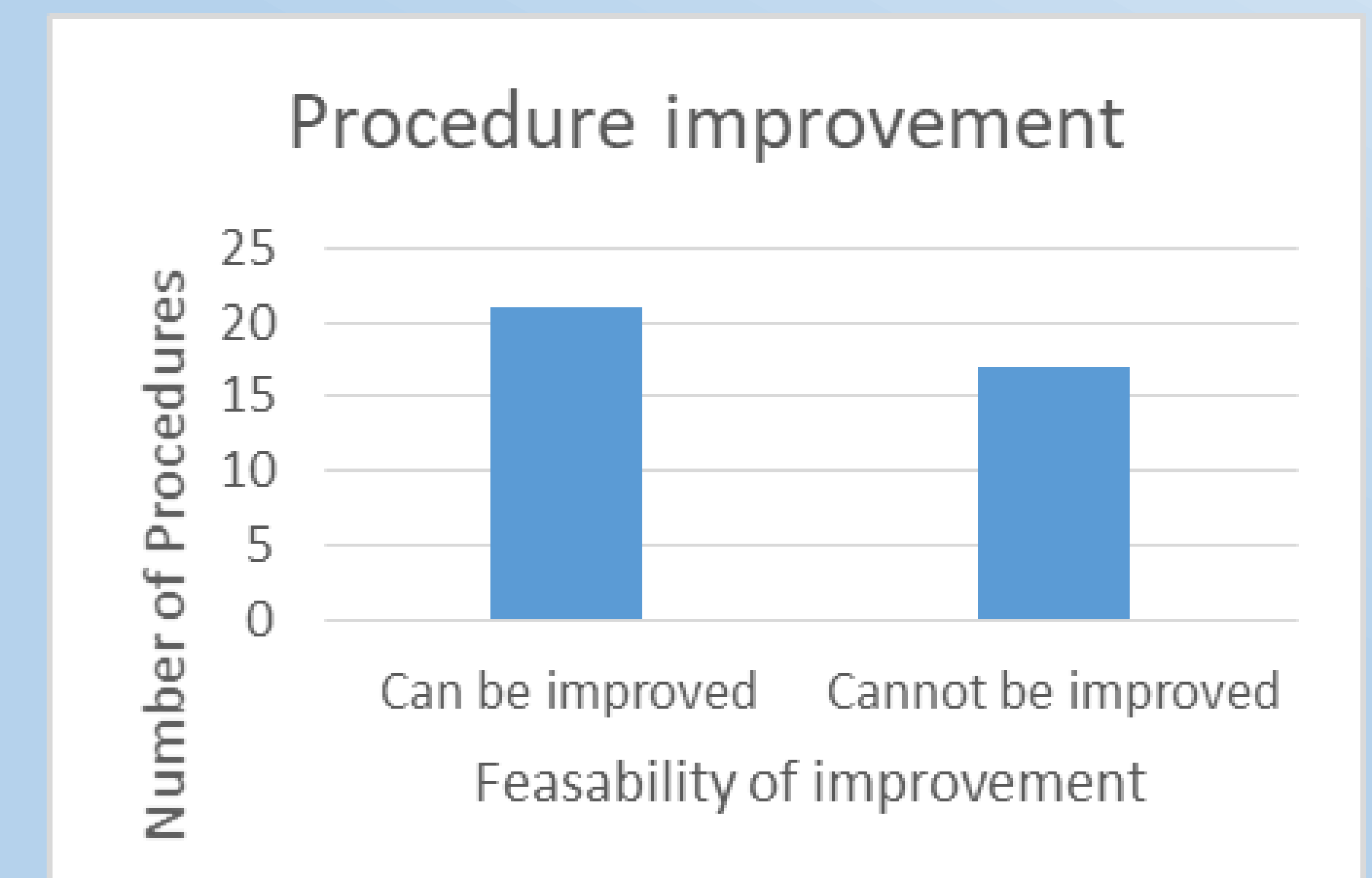


RESULTS

The “Critical Path” schedule has seen improvements of around 10% of total length by adjusting the procedures that are considered in the critical path. The efforts were concerted between the production shops, Ship’s Force, and shipyard planners that normally set the work schedule. The shorted procedures combined with the decreases requirements for preparation work that is not Ship’s Force responsibility allowed the shipyard to streamline its efforts to more efficiently use its resources [2]. Some examples are the combination of various work items into one job and working two or more job sites at the same time due to the preparation work already been undertaken by Ship’s Force.



In coordination with Ship’s Force and SRF’s Production and Planners, 22 procedures in total have been improved, as shown in Figure 1, involving maintenance of surface ship Gas Turbines used for propulsion and electricity generation, inspection and repair of Hull structures and habitability systems [3]. Preparation work for this procedures normally takes a large portion of the time to complete this procedures. Most of the improvement was focused in this areas to cut the total time of the procedures and cutting the preparation time by either removing from the procedures completely, so it can be performed by Ship’s Force or streamlining it or by streamlining the preparation in a way to cut the total time. This procedures will be used in the upcoming availability for the US Destroyer, USS John McCain, which was involved in a collision a few years back.



CONCLUSION

During the course of the project, it was found that about half of the procedures that were intended to be improved would be too labor intensive to improve in the time available to complete the project. The other procedures selected were improved following the input of Ship’s Force, Production team and SRF Planners. This means that the total results for the project as a whole were mixed. Ship’s Force would require improve training that would need to be prepared and tested before it can be implanted. The training is intended to allow Ship’s Force to take a bigger maintenance role by performing more maintenance “at sea” [4]. The positive results will have a major impact in the way maintenance availabilities will be monitored and controlled going forward. Using this project as a blueprint, other maintenance facilities for the US Navy can improve the way they perform maintenance to have an overall improvement in the US Navy fleet, not only on the 7th Fleet.

REFERENCES

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- [2] Palmer, R. D. (2019) Maintenance Planning and Scheduling Handbook (4th ed.) New York, NY: McGraw-Hill Education.
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- [4] Eckstein, M. (2019, March 21) Navy Needs More Dry Dock for Repairs, Says First-Ever Maintenance Report. USNI News. Retrieved from <https://news.usni.org/2019/03/21navy-needs-dry-dock-repairs-says-first-ever-maintenance-report>.