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Defence Innovation Network Grant Scheme: Pilot Project

LASER-BASED CORROSION MANAGEMENT FOR NAVAL PLATFORMS

PROBLEM

Corrosion is a multi-billion dollar cost centre for Navy but has been managed in much the same way for decades. There is room for improvement, in terms of cost reductions and coating performance, and an appetite to explore the innovative solution space.

NEED AND RELEVANCE TO DEFENCE

An area of particular difficulty is complex external fittings such as deck tie downs, hatches, safety nets and securing devices, complex welding, overhangs etc. Repairing corroded fittings is a noisy and time consuming process. Results vary due in part to access limitations (e.g. getting underneath deck tie-downs is fiddly awkward work) and process adherence (workers may be Navy or Contractor of various skill and diligence). Similarly, internal tanks (e.g. fuel, potable water, salt water ballast) contain complicated geometry including stringers, ladders, overhangs and welds, and can be difficult and time consuming to properly clean, prepare and coat. Achieving a clean, grease and salt free surface on which to apply coatings can be very difficult in these situations leading to poor coating performance which ultimately needs replacement.

RESEARCH QUESTION

RAN is looking for innovative, practical approaches to better corrosion management across a broad solution space. A non-exhaustive list of examples include:

- Digital and robotic processes,
- Laser surface treatment to remove corrosion and impurities,
- 3D scanning and additive processes to treat pitting,
- Tooling for preparation of specific geometries,
- Quality assurance and surface/coating inspection methods ensuring more consistent results.

EXPECTED OUTCOME

Solutions may be derived from other industries or applications but considered for the Navy environment. Would it be best managed by specialist contractors, by Defence prime contractors, or even by Navy personnel whilst at sea? If so could a unit be stowed and deployed on a ship for use at-sea to improve ships husbandry?