

# AGING FLEETS



# LOW-COST MODERNIZATION

## 1 Proactive Preventive Maintenance

*Regular servicing and condition monitoring extend vessel life.*  
Routine maintenance, such as vibration analysis and oil diagnostics, helps detect early failures, reducing costly breakdowns and ensuring optimal engine efficiency.

## 2 Advanced Hull & Propeller Coatings

*Next-gen coatings reduce drag and prevent marine growth.*  
Silicone-based and foul-release coatings keep hulls smooth, improving fuel efficiency while delaying expensive dry-dock maintenance.

## 3 Propeller Upgrades & Energy-Saving Devices

*Retrofitting propellers and adding efficiency-enhancing devices boosts performance.*

Upgrading to modern propeller designs or installing PBCF and Mewis Ducts reduces fuel consumption and optimizes thrust.

## 4 Optimized Slow Steaming

*Reducing speed significantly cuts fuel consumption.*

By operating at lower speeds and using engine tuning kits, vessels burn less fuel while maintaining efficiency, extending engine lifespan.

## 5 Weather Routing & Voyage Optimization

*AI-powered software improves route efficiency and fuel use.*  
Real-time weather data and ocean current analysis help ships avoid rough seas, minimizing delays and unnecessary fuel burn.

## 6 Just-In-Time Arrivals

*Aligning ship speed with berth availability reduces idle time.*

Instead of waiting at anchor, vessels adjust speeds to arrive precisely when needed, cutting fuel waste and port congestion.

## 7 Fuel Monitoring & Performance Analytics

*Real-time IoT data identifies inefficiencies and optimizes fuel use.*

Installing fuel flow meters and performance analytics tools helps shipowners detect waste and improve operational decisions.

## 8 Automation & Energy Management

*Automated power distribution cuts unnecessary fuel consumption.*

Smart energy systems optimize HVAC, lighting, and auxiliary power usage, reducing generator loads and overall fuel costs.

## 9 Crew Training & Incentives

*Educated crews make better fuel-efficient decisions.*

Training programs and incentive-based fuel savings initiatives encourage optimal speed management and proactive maintenance.

## 10 Low-Cost Compliance Tweaks

*Simple adjustments help aging ships meet new regulations.*

Engine power limiters and fuel mix optimization ensure compliance with IMO rules while lowering fuel consumption and emissions.