



**LIGHTHOUSE**  
MARITIME SERVICES LLC

# Coating Inspections

From Pre-Application to In-service Failure Investigations

AUGUST 2019

[www.lighthousemaritime.com](http://www.lighthousemaritime.com)





# OUR VALUES

## Lighthouse Understands Your Coating Inspection Needs

### TIME-EFFICIENT

ROUND THE CLOCK, HANDS-ON SERVICE

### THOROUGH

ON ALL ASPECTS OF INSPECTION & DOCUMENTATION

### COMPETITIVE

DAILY RATES, VALUE FOR MONEY

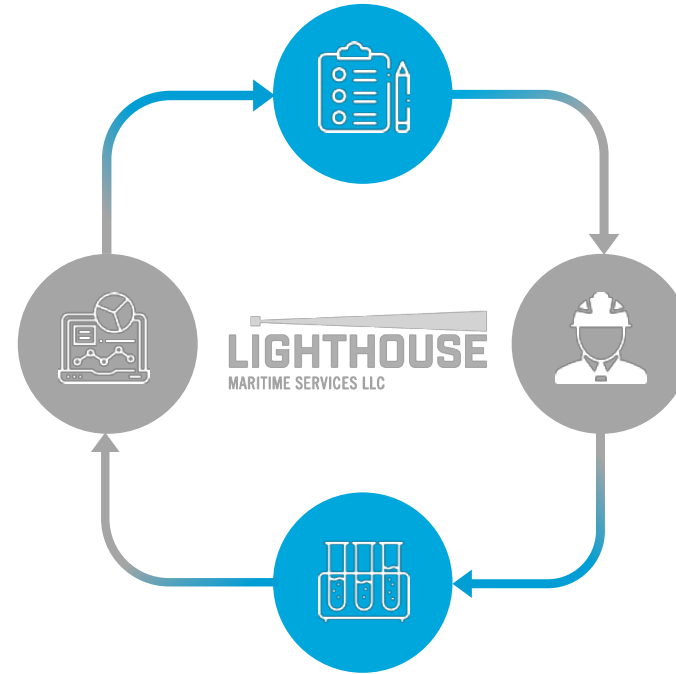
### INTELLIGENT

COMPREHENSIVE & REAL-TIME REPORTS

### THOROUGH LOOK INTO ISSUES



PRODUCE INFORMATIVE REPORTS



SPECIALISED TESTS RECOMMENDATIONS

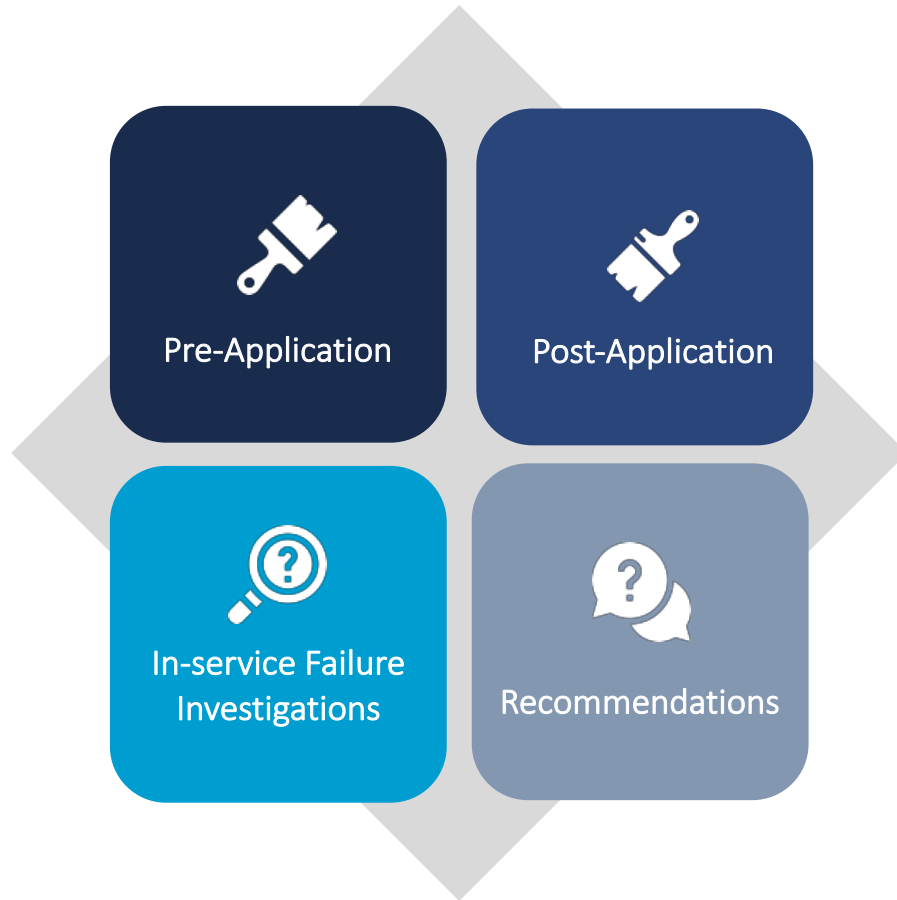


PERFORM TESTS ON COATING





# SCOPES OF WORK



## OVERVIEW

Pre-Application inspections cover surface preparation aspects, whether conforming to the manufacturers surface preparation standards, as well as surface cleanliness. Ambient conditions are checked to ensure the coating is applied in the right environment. All these contribute to the longevity of the life of coatings, preventing premature failures.

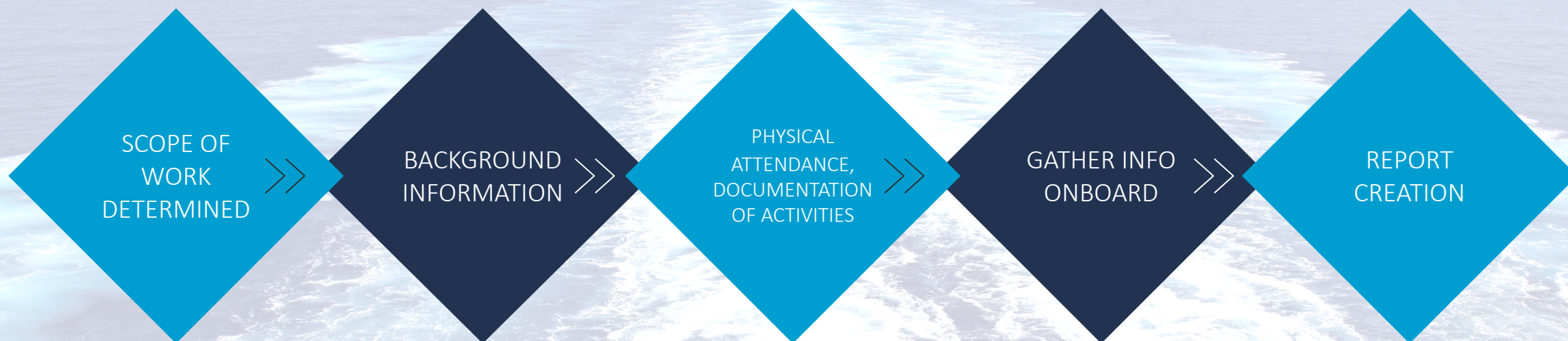
Post-Application inspection covers aspects after the paint has been applied. Measurement of Wet and Dry Film Thickness, whether conforming to the required thickness specifications given by the manufacturer. Defects and discontinuities are detected before coatings go to service; perform necessary repair steps to prevent proliferation of corrosion during the early service life.

In-Service Failure Investigation is requested when significant breakdowns or coating damage is observed during service. The possible origin and mode of breakdown formation is studied and related to existing records of coating usage, coating maintenance records, chemical resistance list of the coatings, to produce a well-founded evidence for the investigation.

Based on inspection findings in a given scope of work, timely recommendations are given, or further investigation angles can be explored so as to come up with the best solution possible.



# INSPECTION PROCESS



Know what information the client wants

Important information is gathered before the job starts; what coating type, what standards are needed, specific instructions from client

Perform the inspection on-site, recording all data from tests performed, immediate reporting of any non-conformance to client

In case of damage investigations, information about usage history, maintenance records are also obtained

All data gathered are related, trends are identified, and a sound conclusion and recommendation is discussed with the client



# TESTING CAPABILITIES



## Hygrometer

Measurement of Relative Humidity, Air and Surface Temperature, Wind Speed and Dew Point which are important parameters to monitor before and during paint application.



## Portable Microscope

Magnified examination of coating features/breakdowns allows a more in-depth look at a problem, important during investigations.



## Infrared Thermometer

Optimum surface temperature should be maintained during paint application, as well as temperature verifications during hot-curing of polymer coatings.



## Surface Profile Test

Measurement of substrate's peak to valley surface profile by Replica Tape or Digital Profile Gauges, to determine whether surface conforms to the coating manufacturer specifications.



## WFT & DFT Measurement

Measurement of wet film during application using wet film combs; dry film thickness by Eddy-current digital gauges to ensure conformance to coating manufacturer specifications.



## Adhesion Test

Quantitative and Qualitative adhesion analysis between paint layers and paint-and-substrate, using pull-off adhesion tester, usually performed during investigations.



## pH Tests and Soluble Salts

Detection of foreign substances on prepared surface, especially salts which can cause premature coating failure, when not removed.

## IN-HOUSE, ON-SITE TESTS



# TESTING CAPABILITIES



## Immersion Tests

Immersion Tests give insight to the durability of the coatings while immersed in a particular aggressive liquid environment.



## Differential Scanning Calorimetry

Investigation of degree of cure of paint samples, as well as stability in heated conditions.



## Infrared Spectroscopy

Characterization of polymer paint samples in terms degree of cure, and presence of organic contaminants/solvents.



## Chromatography

Analysis of organic contaminants/solvents embedded in the polymer coating network (either from original formulation or absorbed through service).



## Atomic Absorption / Emission Spectroscopy

Characterization of paint samples for presence of inorganic materials contaminants.



## Electron Microscopy

Where extremely high magnifications are required on viewing paint samples, this technique gives an insight on the paint sample characteristics on the molecular/atomic level.



## Other Specialized Tests

RELATED SPECIALIZED TESTS THAT CAN BE SUBCONTRACTED OUTSIDE LIGHTHOUSE

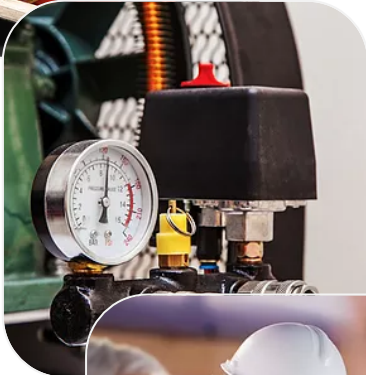


## WHAT WE ENDEAVOUR



WE KEEP UP TO DATE WITH THE LATEST TECHNOLOGY ON PAINT INSPECTION INSTRUMENTS.

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WE USE DIGITAL GAUGES WHERE RAPID DATA LOGGING IS POSSIBLE, ALLOWING REAL-TIME, FASTER DATA ANALYSIS AND REPORTING

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WE FOLLOW THE SCOPE OF WORK REQUIREMENT TO GIVE YOU AN INFORMED ASSESSMENT.

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# COATING EXPERIENCE



**Aceson Trinidad BSc.**  
(licensed chemist)  
**NACE Level 2 Paint Inspector.**

Ace and Rex have extensive experience in the transport of bulk chemical cargoes utilizing various coating types.

Each have completed numerous coating surveys from general condition to more exhaustive breakdown and corrosion investigative surveys for Owners and PNI Clubs.

Their experience, qualifications and knowledge of all aspects relating to the (tank) preparation and carriage for the wide variety of chemical cargoes now transported in lined tanks, gives them an unrivaled position in this sector of the industry.



**Rexan Balcita. BSc.** (Licensed Chemist)  
**NACE Level 1 Paint Inspector.** (Level 2 pending).





## WHAT OUR CLIENTS SAY

*“We very much consider Lighthouse to have become part of our trusted team. The advantage Lighthouse brings is prompt, clear advice and assistance. Their rates are favorable and that lets us, and our Clients, have the opportunity to benefit from having experienced Lighthouse chemists quickly on the ground. We have successfully worked with Lighthouse on coating defect investigations and stainless-steel tank repairs. This illustrates the real depth of Lighthouse’s understanding of tankers and makes them an invaluable consultant to help resolve matters promptly and cost effectively.”*

**ARNOLD RIDLEY, RR & CO**

*Specialist London Chemical Tanker Lawyers*



Visit [www.lighthousemaritime.com](http://www.lighthousemaritime.com) for more about us.



# THANK YOU

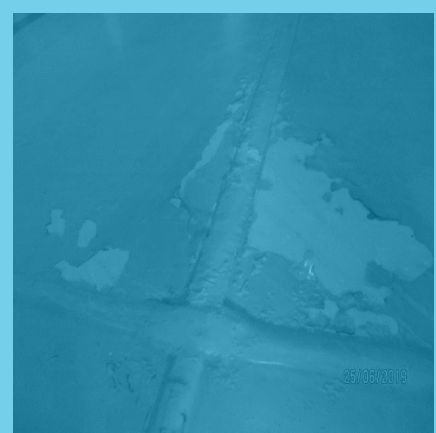
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