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To:	All Surveyors/Auditors
Applicable to flag:	All Flags
Subject:	**Salt Limits to Prevent Premature Coating Failures**
Reference:	Drydock and Special Survey

Salt Limits to Prevent Premature Coating Failures

The presence of non-visible residual surface salts and their impact on life cycle coating performance is well documented, yet no widespread industry standards exist to easily reference levels that will diminish the risk of coating failure. Since many industrial projects have an original cost of millions of dollars, a failure to address the potential presence of residual salts and remediate accordingly can result in unbudgeted costs, which become a multiple of the original project outlay.

Salt-induced pitting before and after surface cleaning (not the same location).

The shortage of readily available, industry-wide references generates a frequent question from many companies and organizations on the acceptable limit(s) of various common anionic species for the environment and conditions with which they each are dealing. It is the variability of conditions, severity of service, coating or coating system applied, condition of steel to be protected, service life of the coating to be achieved and other such factors that have led to many

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opinions not only about the need to take salts into consideration, but also about what specific levels may prevent premature failure.
Early adopters, companies and organizations that recognized the linkage between coating performance and the potential presence of residual surface salts, and made changes to their specifications, are benefiting with significant cost savings. As an example, for very large tank relining projects, which can easily exceed $1 million, prior requirements of relining cycles every five to seven years have been eliminated. Linings installed under the revised regimen of testing and decontamination are in their 20th year and are expected to achieve a 25-year minimum life span. The total cost of ownership impact is very significant not only in association with these maintenance costs savings, but also in the deferral of asset utilization loss as well as administrative and overhead savings.


Tank salt-induced coating failures.
Although there is no widespread consensus on numeric limits, sufficient statistical data collected from specifications in various industries—where proven cost savings from reduced protective coating cycles have been realized—can be shared. Yet, industry-specific organizations have established limits: such as the International Maritime Organization (IMO), with an equivalent chloride limit of 3µg/cm^2 for ballast tanks; or NORSOK, with an offshore immersion service chloride limit of 1µg/cm^2. Specifies have worked comfortably with limits based on risk, with high-value assets or immersion-severe service requiring low-risk tolerance. On the other hand, atmospheric service for coatings does not have the level of service severity resulting in willingness to consider a higher risk.
Knowing what anionic species is present and its concentration (amount) is important and directly related to the outcome of the coating performance.
Alternatively, temperature-related conditions for coating service should be taken into consideration because the corrosion-inducing effect is increased as the temperature rises.
Most, if not all, coating manufacturers address the issue of residual surface contaminants, inclusive of salts, in the guidelines provided in their data sheets or other literature for general use.

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REFERENCES:

- **Drydock and Special Survey**

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