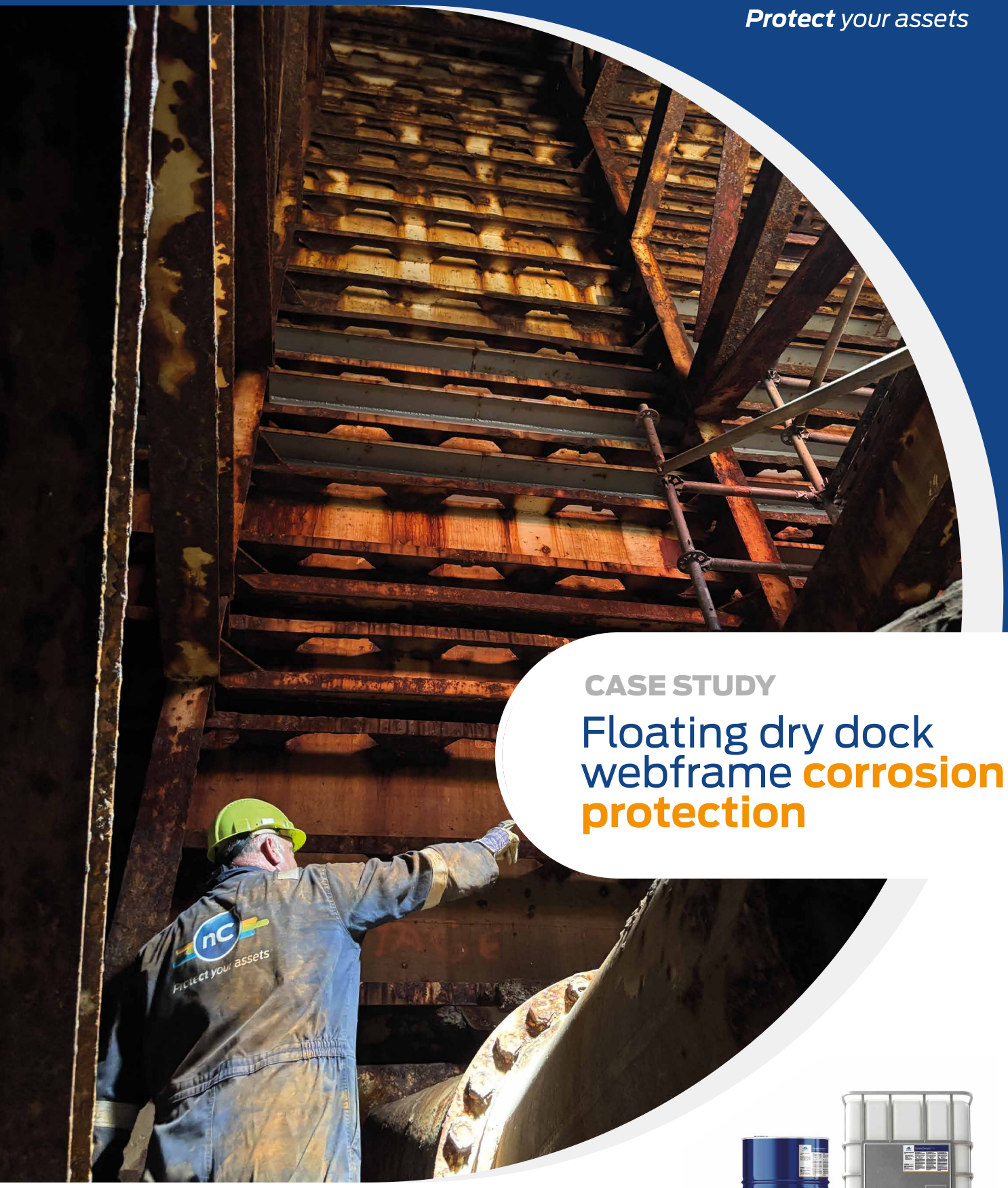
Protect your assets



CASE STUDY

Floating dry dock webframe corrosion protection

Stop corrosion. Without blasting.

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Floating dry dock webframe corrosion

Asset: Floating dry dock (permanently moored, North Sea)
Product used: nC Corrosion Passivator Fluid

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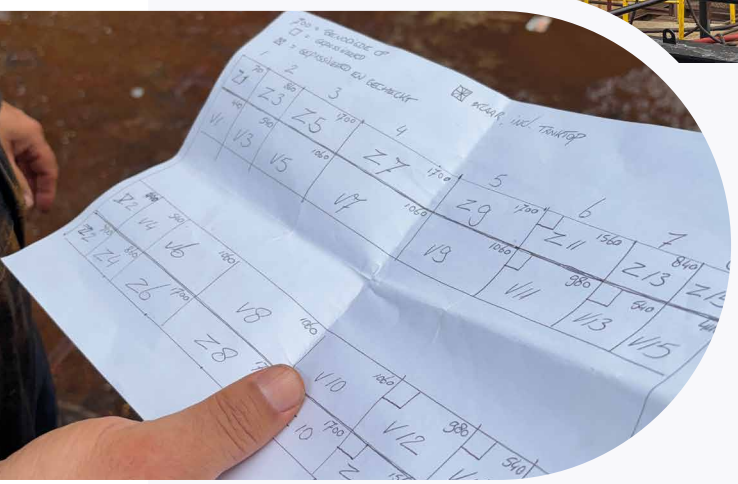
Executive summary & objective

The objective of this project was to safeguard the structural integrity of the floating dry dock's webframes and ballast tanks against active corrosion, while avoiding operational downtime, staging costs, and environmental hazards. Continuous ballasting and de-ballasting with harsh North Sea saltwater created a severe, ongoing corrosion threat that required an immediate, non-disruptive solution.



Scope of application

Treatment encompassed all internal steel structures exposed to routine ballasting:

- **Bottom tanks:** Internal spaces beneath the main dock floor.
- **Wing towers:** Vertical structures housing wing tanks, bulkheads, and complex webframes.

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The technical challenge & shipyard requirements

The shipyard required a long-term corrosion preservation solution for the floating dock's internal tanks and web frames that could be executed while the dry dock remained in-service, without disrupting daily docking operations or causing downtime for the dry dock's operation.

Conventional coatings were ruled out due to major operational bottlenecks:

Scaffolding constraints: Most coatings can only be applied when the steel surface meets a certain level of surface preparation. The shipyard wanted to avoid erecting staging inside narrow, high-vertical wing towers, a process that is cost- and labor-intensive, and physically impossible in complex structural zones.

Grit blasting hazards & waste: Traditional abrasive blasting was impractical due to poor visibility and complex frame geometries (stiffeners, tight corners, and hard-to-reach edges). Furthermore, the shipyard aimed to avoid the heavy costs, delays, and environmental burdens of removing grit waste.

Surface preparation: Standard coating systems require extensive surface pre-treatment, specifically a clean, dry, sandblasted substrate. These are environmental conditions that the shipyard found virtually impossible to maintain in damp ballast tanks during active operations.

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The implemented solution

To meet all of the shipyard's operational and technical criteria, **nC Corrosion Passivator Fluid** was selected as a fast, surface-tolerant preservation system:

Surface-tolerant application:
Works directly on wet, rusted steel with zero mechanical surface preparation or grit blasting.

Fast & complete coverage:
Combined airless spraying with a floating application method that naturally reached intricate webframes and tight spaces, delivering total coverage without scaffolding.

No downtime:
Carried out entirely in-service during routine docking schedules, preserving structural integrity without sacrificing asset availability.

Shipyard reference & proven track record

The shipyard selected **nC Corrosion Passivator Fluid** based on their own successful in-house reference experience. Since 2021, internal structures of a bridge pontoon at the yard have been protected using the samespray-and-float method with seawater, delivering flawless, long-term corrosion resistance.

Photo taken during the inspection on 30 June 2026, approximately 4.5 years after application of nC Corrosion Passivator Fluid.

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CONSUMPTION, LOGISTICS & PACKAGING

Developed for simple and fast execution, **nC Corrosion Passivator Fluid** can be applied by in-house shipyard crews or external contractors. Upon request, nC provides on-site technical supervision to guarantee a fast, seamless application without unexpected delays.

Calculated consumption:

- **Float application:** 1 liter per 1 m^3
- **Airless spraying**: 5 to 7 m^2 per liter

Onsite logistics:

Supplied in 1,000-liter IBCs or 20-liter jerrycans staged directly alongside tank manholes across the dock deck for fast, efficient access.

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SAFETY, HEALTH & OPERATIONAL LIMITS

Personal Protective Equipment (PPE) & Toxicity

Always refer to the product Safety Data Sheet (SDS) for detailed handling guidelines. Key safety and health parameters include:

Respiratory protection:
Crew must wear a half-face respirator mask equipped with an A2 or A3 filter during spraying.

*(**Note:** Full-face masks should be avoided during spraying, as overspray forms an oily film on the visor, reducing visibility).*

Toxicological profile:
nC Corrosion Passivator Fluid is non-carcinogenic, non-mutagenic, free from solvents and heavy metals.

Environmental & Operational limits

nC Corrosion Passivator Fluid can be applied during extreme conditions, from high ambient heat down to temperatures just below freezing (0°C). Unlike standard coatings, the dew point is irrelevant when applying Corrosion Passivator Fluid.

*(**Note:** Full-face masks should be avoided during spraying, as overspray forms an oily film on the visor, reducing visibility).*

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STEP-BY-STEP APPLICATION

Step 1: Bottom tank conservation

1 **Inspection & cleaning:** Inspection & Cleaning: Bottom tanks were inspected for heavy sediment, and accumulated mud and clay were removed prior to application. Loose rust scale was removed where necessary to ensure maximum penetration.

2 **Overhead & frame spraying:** Crew first sprayed the tank top (the underside of the dock floor) and the upper vertical meter of structural framing, working downward from the tank top to establish initial coverage.

3 **Floor distribution:** The remaining calculated volume of **Corrosion Passivator Fluid** was distributed evenly across the tank floor between transverse frames. Application progressed systematically from the inboard section (mid-dock centerline) outward to the junction where the bottom tank meets the wing tower using a combination of pouring and spraying.

4 **Water cycling & flushing:** the bottom tank was filled with water to float the passivator fluid across structural surfaces, then pumped empty. A submersible pump was used to remove residual water, ensuring the passivator made full contact with the floor.

(***Note:*** *Floating application works equally effectively with both fresh and salt water).*

5 **Water handling & regulations:** Process water was either transferred to the next tank scheduled for treatment or routed into the dock gutter. Direct discharge into open water was strictly avoided to ensure compliance with local environmental regulations.

(***Photo 5. -*** *Because nC Corrosion Passivator Fluid floats on water, it spreads uniformly across the tank. Ensuring even product distribution across all internal tank structures during ballasting cycles.)*

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STEP-BY-STEP APPLICATION

Step 2: Wing tower conservation

1 **Lower level spraying:** Using the dry tank floor for safe access, the crew sprayed nC Corrosion Passivator Fluid across the floor, web frames, and internal bulkheads up to a height slightly above the pontoon deck (dock floor) level.

2 **Water filling:** Water was pumped into the tank up to the level of the dock floor, a step executed during routine ship docking operations.

3 **Surface dosing:** The pre-calculated volume of nC Corrosion Passivator Fluid for the upper wing tank was poured directly onto the water surface inside the tank.

4 **Controlled floating cycle:** The tank was closed and flooded to full capacity. Because the Corrosion Passivator Fluid floats on water, the flooding and de-ballasting cycle naturally distributed a uniform, continuous layer across he full height of the web frames and internal bulkheads.

Before** application of **nC Corrosion Passivator

After** application of **nC Corrosion Passivator

*(**Note:** The rate of water rise and fall was strictly maintained at or below 20 cm per minute to ensure optimal contact time for the passivator layer to deposit onto the steel.)*

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INSPECTION, CURING & LONG-TERM PROTECTION

Post-application visual inspection

Following deballasting, the steel surface reacts with the fluid, turning into a distinct **anthracite-colored** protective layer.

Visual inspections check for:

- **Anthracite surface:** Indicates successful chemical reaction and full passivation.
- **Dry spots:** Indicates areas missed during spray or floating where the product did not contact the substrate.
- **Bright orange spots:** Indicates non-passivated active rust where the product failed to penetrate the substrate, which requires localized touch-up.

Photo report documentation confirms that full coverage across all internal dock structures have been fully achieved.

RETURN TO SERVICE

Following completion of the floating cycle, a brief 4-hour reaction and curing period was observed. Immediately after this window, the tank was cleared for full operational service, enabling the dry dock to resume routine ballasting and de-ballasting with fresh or seawater without delay.

Curing & long term protection

Over time: The treated steel surface dries out and loses its initial oily feel. This oiliness is temporary and functional. It acts as a carrier enabling the active passivator to chemically bond with the substrate.

Long-term passivation: Once bonding is complete, the fluid has fulfilled its carrier role. A dry surface does not indicate loss of protection. The passivated layer remains fully protected against ongoing corrosion.

Self-passivating reservoir: Active residue remaining inside the tanks continues to serve a functional purpose. During future docking cycles, as ballast tanks flood and empty, the remaining product is continually redistributed and deposited onto the web frames and structural members.