# HITEK-nology
## SOLUTIONS


CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

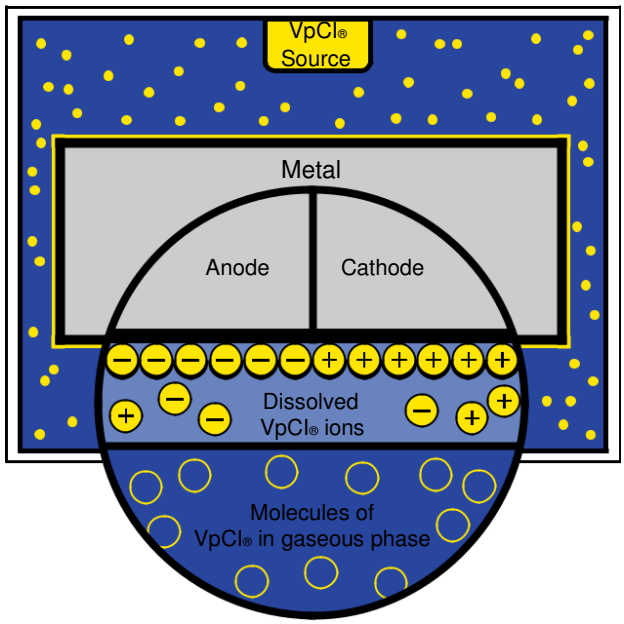
HITEK-nology SOLUTIONS

# Vapor phase Corrosion Inhibitors (VpCI®)

Corrosion costs industry billions of pounds each year.

HITEK-nology Solutions Limited can, using Cortec's VpCI® products, prevent assets and high value spares from corroding, we can also reclaim parts etc. that have corroded. This both saves money and increases the life of the equipment. VpCI's are environmentally friendly and have little or no Volatile Organic Compounds (VOC's). VpCI® can be delivered in a variety of ways, including misting, fogging, spraying, brushing, dipping and wrapping etc. Depending on the individual task would dictate the method used and the type of product chosen. VpCI's are available in such forms as powders, liquids, emitters, impregnated paper, plastics and cardboard etc. and can give protection in any environment for up to 25 years.

VpCI® works by conditioning the enclosed atmosphere with a protective vapour which migrates to all recessed areas and cavities, the vapour condenses on the metal surface and the ions dissolve in the moisture layer (wa-ter electrolyte). These protective ions are attracted to the metal surface forming a monomolecular protective layer, this protective layer re-heals and self replenishes through further condensation of the vapour. The picture to the right shows this. HITEK-nology Solutions Limited is the only approved European applicator of the Cortec® Corporation VpCI® products. In addition HITEK-nology Solutions Limited is a fully audited ISO 9001 registered company.




**Ionic Action of VpCI® Creates a Molecular, Corrosion Inhibiting Layer.**

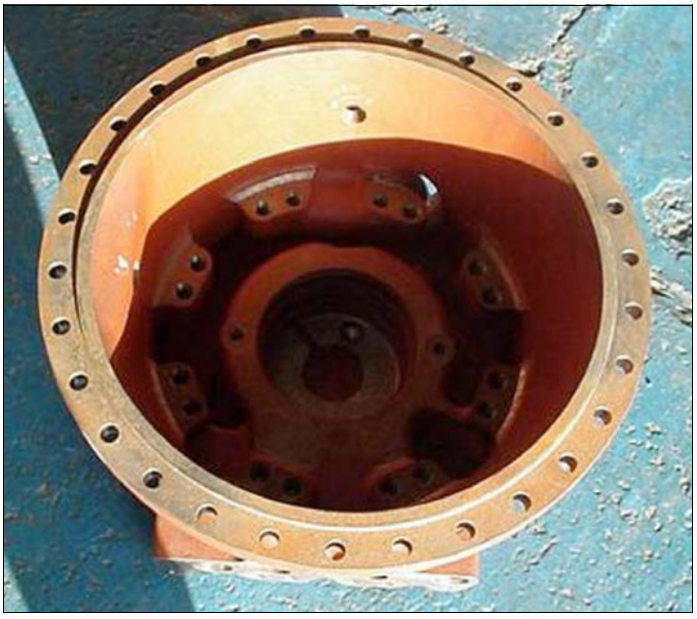
# How VpCI® Works

- Vaporizes
- Conditions enclosed atmosphere with a protective vapor.
- Vapor condenses on all metal surfaces.
- Ions dissolve in moisture layer (water electrolyte).
- Protective ions are attracted to metal surfaces.
- Ions form a thin molecular protective layer at the metal surface.
- Protective layer re-heals and self-replenishes through further condensation of the vapor.
- VpCI® combines with other functional properties.
  Antistatic, Lubricating, Cleaning, Paint Removing, Desiccant, Poly-meric, Coatings, Rust Removing, Fire Retarding.

# ZF Casings

ZF casings are a cast casing that houses the cogs and motors for driving the lorry mounted cement mixers. Bosch Rexroth had been storing these casings in an environment that had caused the casings to rust. They were in the process of scrapping the casings when they decided to approach HITEK-nology Solutions Ltd to pro-vide a solution.

The casings were soaked in VpCI®-422 to remove the rust. The casings were then washed down with VpCI®-415 and dipped in 418LM to clean / degrease them. The casings were then misted with VpCI®-377 to give them a protective coating until fitment. The result was that Bosch Rexroth were able to use the casings at a frac-tion of the cost to buy new.



**Date:**
May 2007

**Customer:**
Bosch Rexroth

**Location:**
Fife, Scotland

**Products Used;**
VpCI®-377, VpCI®-415, VpCI®-418LM & VpCI®-422

# Coalescer Assembly Module

Siemens had a Coalescer Assembly Module (oil sepa-rator) returned to them, with the 6” diameter internal pipe work in a rusty condition. The overall affected length was approximately 5m. The reason for this, was that the pipes hadn’t been sealed correctly on the module Siemens approached HITEK-nology Solutions Ltd (HSL) to provide a solution that would result in the tubes being reclaimed and protected until reassembly and subsequent use. This task also needed to be com-pleted within three days including collection and deliv-ery between Siemens and HSL.

The internal volume of the pipes was soaked in VpCI®-422 to de-rust them. They were then soaked in 10% VpCI®- 416 mix to clean / de-grease them. The ends were then removed to allow any waste and debris etc. to be removed, and the internal surface to be inspected and dried. The internal volume of the pipes was treated with VpCI®-322, to protect them from future corrosion prior to installation and use.

**Date:**
August 2009

**Customer:**
Siemens, Lincoln

**Location:**
Derby

**Product Used:**
VpCI®-422, VpCI®-416, and VpCI®-322

# Power Station Boilers

An East of England Power Station (PS) has to shut down the boilers once or twice a year for scheduled mainte-nance (known as outage). During outage the boilers cool down and rust forms on the boiler tubes and walls. Upon restarting rust comes out of the chimneys, result-ing in damage to the products of local businesses and environmental issues. On numerous occasions the PS has had to immediately turn off the boilers upon restart and wait for the wind to change direction in order that no more damage was caused to local businesses due to the rust. This has meant a delay in PS being able to generate power and lost revenue. This has been a problem for the last fourteen years; various solutions have been tried without success. HITEK-nology Solu-tions Ltd (HSL) was approached to provide a solution.


The internal volume of the boilers is divided into seven levels, four sections per level, with tube banks running through each level. VpCI®-337 was sprayed on to the tube banks and walls in each level. In addition VpCI®-337 was also sprayed into the top and bottom of the boilers. Three weeks later when the boilers were start-ed no rust came out of the chimneys. This was the first time in fourteen years that PS had achieved this. HSL now carries out this procedure at all outages.

**Date:**
October 2007

**Customer:**
Anon

**Location:**
East of England

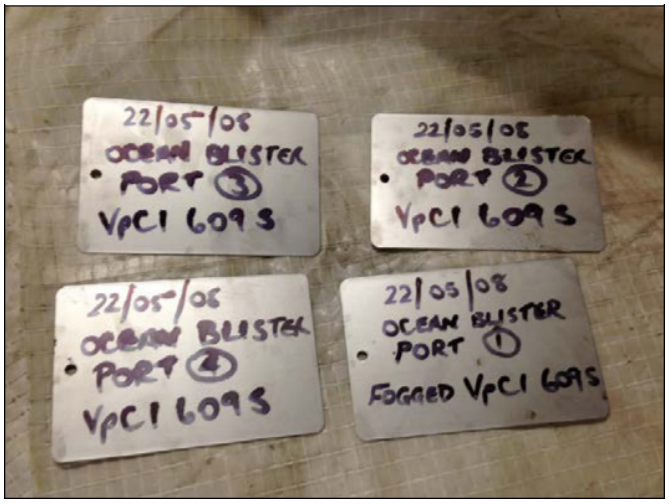
**Product Used:**
VpCI®-337

• HSL now carries out this procedure at various other Power Stations.

# Warship Blister Tanks

Blister tanks are two void spaces that were fitted on ei-ther side of a Naval Warship post manufacture.These void spaces are subject to two inspections per year by Lloyds. Due to the way these tanks had been fitted, a lot of mois-ture was in the air resulting in corrosion. Lloyds were con-cerned about the amount of corrosion appearing inside the void spaces. HITEK-nology Solutions Ltd was approached by an MoD IPT to provide a solution.

VpCI®-609 was fogged into the internal volume of the voids resulting in a low cost two years anti-corrosion protection. HSL were requested to retreat the Blister Tanks again in June 2008, and again in 2013. On the right is a picture of the sacrificial plates placed in the Tanks in 2008 (they were therefore in the tanks for five years), as can be seen, pro-tection was achieved.




**Date:**
July 2006, May 2008 and June 2013

**Customer:**
MoD IPT

**Location:**
Plymouth

**Product Used**
VpCI®-609

# Mexe-Flote Cells

Mexe-flote cells are individual cells of which there are four types and sizes; bow forward, bow aft, centre and stern. These cells get joined together to form a landing craft by the British Army to ferry equipment from ship to shore. In the past various treatments have been tried to prevent the inside of the cells from rusting, none have worked satisfactorily.

HITEK-nology Solutions Ltd was approached by the customer to provide a solution. Treatment chosen VpCI®-609s is fogged into the internal volume of the cells resulting in a low cost two years anti-corrosion protection.

Cells that have been opened up for repair etc. two years later were totally rust free.

**Date:**
Ongoing since February 2007

**Customer:**
MoD IPT

**Location:**
Manor Marine, Portland
Landau UK, Southampton

**Product Used:**
VpCI®-609s

# Fuel Storage Tank

The power station at Kings Lynn has a 50,000 liter fuel storage tank. This tank is not currently used and would be unlikely to be used in the near future. The power sta-tion staff were concerned that the tank could start to cor-rode, particularly from the inside out due to the fact that the inside of the tank was just bare metal.

The power station staff approached HITEK-nology So-lutions Ltd to provide a solution that would protect the inside of the tank from corrosion for a period of up to two years, whilst at the same time allowing the tank to be placed into use without any requirements for cleaning it out first should the need arise.

VpCI®-705 was chosen as this was also a fuel additive and would ensure that the storage tank could be put straight back into use without the need for any cleaning or any adverse affect on any fuel that would be stored in the tank. This treatment has resulted in the low cost storage of this asset for a period of up to two years.

**Date:**
September 2010

**Customer:**
Centrica

**Location:**
Kings Lynn Power Station

**Product Used:**
VpCI®-705

# Landing Craft Preservation

A MoD IPT wants to deploy these landing craft to the Falkland Islands for a period of two years. Previously they had to bring them back after one year due to cor-rosion, at a cost of £40,000 The MoD IPT approached HITEK-nology Solutions Ltd to provide a solution that would result in the landing craft being able to stay down the Falkland Islands for a two year period, being avail-able for use but protected from corrosion.

The engines, gearboxes and V drives were treated with VpCI®-323. The coolant systems were treated with M640L. The fuel systems were treated with VpCI®-705. The en-gines were then run for 15 minutes. The landing craft was then removed from the sea, washed down and dried. It was then placed onto the bottom part of the two piece Corshield bag. VpCI®-111 emitters were placed at various locations in the wheel house and engine compartments to protect the electronics. VpCI®-132 foam pads were placed around the landing craft. The top part of the bag was then fitted. The bag was manufactured with access at the lifting points, allowing the craft to be transported without remov-ing it from the bag. The landing craft is now in the Falkland Islands and is simply removed from the bag when required and stored in the bag when not required.

**Date:**
April 2007

**Customer**
MoD IPT

**Location**
Marchwood

**Product Used**
Corshield®, VpCI®-111 emitters, VpCI®-132 foam pad emitters, VpCI®-705 (fuel additive), M640L coolant additive,VpCI®-323 (oil additive)

# Auxiliary Boilers

The Auxiliary boilers of a certain type of Naval Frigates and Destroyers had problems with premature coil failure due to corrosion. A MoD IPT approached HITEK-nology Solutions Ltd to provide a solution.

It was decided to conduct a minor trial over a period of 6 months between March 2008 and September 2008. A Naval Ship was chosen that had two relatively new boilers with low usage.

The starboard boiler was chosen as the trial boiler, and was treated monthly with 1 liter of VpCI®-649; the fill rou-tine was then carried out for 15 minutes to circulate the treatment throughout the system.

Both boilers were checked at the start and finish of the trial, although some deterioration could be seen in the un-treated boiler, no deterioration was evident in the treated starboard boiler. In addition the hotwell (water holding tank) had also been protected, which would also improve the through life of the hotwell incurring even greater sav-ings. All these types of Frigates and Destroyers are now treated with 1 liter of VpCI®-649 on a monthly basis.

**Date:**
March - September 2008

**Customer:**
A MoD IPT

**Location:**
On board a Naval Ship

**Product Used:**
VpCI®-649

# Thames Barrier Cranes

Pelligrini UK have been contracted by the UK Environment Agency to build seven new cranes to replace the existing cranes on the Thames Barrier. One crane was to be delivered in May / June 2011, with the remaining six delivered in early 2012. These cranes are then to be left at the side of the Thames Barrier until fitment in 2013.

The Environment Agency wanted the cranes protecting from corrosion whilst being stored outside, next to the Thames Barrier. Pellegrini UK Ltd approached Hitek-nology Solutions Ltd to provide a solution.

VpCI®-132 foam pads were placed at the relevant plac-es and the crane then wrapped using VpCI®-126 HP UV Shrink Film. The shrink film was then shrunk onto the crane using a butane powered heat shrink gun This treat-ment has resulted in the low cost storage of these high value assets for a period of up to two years.

At the last minute HSL were asked to treat the first crane on a barge at Tilbury docks, from there it was to be shipped along the River Thames and will be removed from the barge when the crane is to be fitted.


**Date:**
June 2011

**Customer:**
Environment Agency / Pellegrini UK Ltd.

**Location:**
Tilbury Docks

**Product Used:**
VpCI®-126 HP UV Shrink Film and VpCI®-132 foam pads

# CVR(T) Transit protection

The MoD wanted to trial a system that would protect vehicles from corrosion, whilst in transit, (in this case CVR(T)'s). The DRACAS team approached HITEK-nology Solutions Ltd (HSL) to provide a solution.

A low grade carbon steel plate was fitted to the front on each half of the vehicle and also inside. The CVR(T) was washed down with VpCI®-415 mixed with water. Half of the vehicle was then treated with VpCI®-389D temporary coating mixed at 50% with water The vehicle was then left outside for six months and checked monthly. After a couple of months the vehicle had filled up with rain water (failed hatch seals), and signs of corrosion were seen inside the vehicle. It was de-cided to fit VpCI®-132 foam pads inside the vehicle and also an extra steel plate.

At the end of six months, the treated half was showing no signs of corrosion, unlike the untreated half which had degraded considerably. Also, it was evident that the foam pads had stopped any further corrosion inside the vehicle.

*Note: A full written report is available for this trial.*


**Date:**
September 2012 - March 2013

**Customer:**
MoD (DRACAS)

**Location:**
Ashchurch

**Product Used:**
VpCI®-132 foam pads, VpCI®-389D and VpCI®-415

# ISO Container of spares

The MoD wanted to trial a low cost option of protecting high value spares, whilst being transported in ISO Containers HI-TEK-nology Solutions Ltd was approached by the DRACAS Team to provide a solution.

Two different solutions were trialed, firstly a container was treated with VpCI®-337 a water based liquid treatment and secondly VpCI®-132 foam pads, both containers had the same spares stored inside them. A third ISO container was also used but left untreated as a datum, again the same spares were used. Low grade carbon steel plates were fitted in each of the containers

The containers were left outside for six months, but checked monthly. At the end of the six months, there was no signs of corrosion / degradation in the two treated ISO Contain-ers, however there were signs of corrosion in the untreated VpCI®-132 foam pads would be the better solution as no clean up of the spares would be required.

*Note: A full written report is available for this trial.*

**Date:**
September 2012 - March 2013

**Customer:**
MoD (DRACAS)

**Location:**
Ashchurch

**Product Used:**
VpCI®-132 and VpCI®-337

# CVR(T) Storage

The MoD wanted to trial a system that would protect vehicles in storage, (in this case CVR(T)'s) from corrosion without the need for expensive Controlled Humidified Environment, at the same time allowing the equipment to be placed back into operation at short notice. The DRACAS team approached HITEK-nology Solutions Ltd (HSL) to provide a solution.

The CVR(T) was washed down with VpCI®-415 mixed with water. The engine gearbox and final drives had M529 added to their oil. The coolant had M640L, the fuel had VpCI®-705 and the brakes had M408 added to their systems. All exposed electrical connections were sprayed with VpCI®-239 and all hatch springs, hinges and wheel arms etc. were sprayed with VpCI®-369. The vehicle was then run up for 15 minutes and driven for a short dis-tance. VpCI®-132 foam pads were placed in and around the vehicle before finally being wrapped in VpCI® Mil-Corr® and heat shrunk with a butane powered gas gun. Another CVR(T) was also left untreated as a comparison.

Both vehicles were then left outside for six months. Whilst the untreated vehicle rusted, the treated vehicle was in a as new state when unwrapped six months lat-er. This proved the vehicles could be protected without CHE.

*Note: A full written report is available for this trial.*

**Date:**
September 2012 - March 2013

**Customer:**
MoD (DRACAS)

**Location:**
Ashchurch

**Product Used:**
VpCI®-132 foam pads, VpCI®-239 aerosol, VpCI®-369 aerosol, VpCI®-415, M408, M529, M640L and MilCorr® shrink film

# Power Station Pumps

Barking Power Station is mothballing part of its plant. Included in this were 20 High Pressure (HP) pumps and Low Pressure (LP) pumps that were fitted both indoors and outdoors. These pumps which vary in fluid capacity between 20 and 400 liters fluid capacity which were to be mothballed dry. Also being mothballed were two 6000 liter fluid capacity Condensate Extraction (CEX) pumps, which were to be mothballed wet. HSL were approached to provide a solution to prevent these pumps from corrosion during the 6 -12 month mothballing period.

The HP and LP pumps were treated with VpCI®-377. The VpCI®-377 was mixed at 20% VpCI®-377 and 80% water. This mix was then pumped into the HP and LP pumps and left for a minimum of one hour, before being pumped out again. The pumps were treated in sets of four to keep the quantity of material required to a mini-mum. The VpCI®-377 mix was checked between each set of four pumps with a refracto-meter, to ensure the mix was still at the correct strength and therefor reus-able.

The CEX pumps were treated using VpCI®-649. The VpCI®-649 was added to the system at 1% and then cir-culated to ensure the complete system was protected. This treatment has resulted in the low cost storage of these high value assets.

**Date:**
December 2012

**Customer:**
Thames Power (Barking Power Station)

**Location:**
Barking

**Product Used:**
VpCI®-377 and VpCI®-649

# Turbines

Eggborough Power Station had three £multi million turbines that were to be stored outside for a period of at least two to three years. These were being stored with only tarpaulin covers and were starting to rust.

HITEK-nology Solutions Ltd was approached to provide a solution that would allow the turbines to be stored outside, whilst at the same time being protected from corrosion.

VpCI®-132 foam pads were placed around the turbines. VpCI®-126 HP UV Shrink Film was then placed around the fuselage and shrunk into place using a propane powered gas gun.

This treatment has resulted in the low cost storage of these high value assets for a period of up to three years.

**Date:**
January 2015

**Customer:**
Eggborough Power

**Location:**
Eggborough Power Station

**Product Used:**
VpCI®-126 HP UV Shrink Film and VpCI®-132 Foam Pads

# Salt Gritter Preservation

Ground Control has nationwide contracts which involve the use of gritting lorries. The lorries rust badly and quickly due to the environment they operate in as well as the fact they spread salt.
Ground Control became aware of the work we had done on military vehicles during lay-up and requested that we carry out a trial on one of their gritters.


The vehicle was washed down with VpCI®-415 cleaner degreaser. The electrical junction boxes were treated with VpCI®-101 and 105 emitters. All exposed electrical connections were treated with VpCI®-239 ElectriCorr. The clutch release bearing area the ABS valve and all hydraulic / mechanical connections etc. were treated with VpCI®-369. VpCI®-132 foam pads were placed in the cab and the switch gear etc. were lubricated with CorrLube™ Lithium Grease. Low grade caron steel plates were fitted to both ends of the front bumper and one in the cab. Finally half of the vehicle (including the hopper) was treated with VpCI®-389D.

After a few months the plate on the untreated half of the vehicle had fully rusted, whilst the plate on treated side and the plate in the cab remained unchanged (as new).
All ground Controls vehicles were then treated in June 2014 (including trailers). This treatment was for layup over summer, however the treatment was not removed prior to the equipment going back into use. At the end of the season (March 2015) a massive difference could be seen in the state of all the equipment's. This has resulted in Ground Control now treating all their vehicles for every lay-up period, as well as getting their new vehicles treated in manufacture, which now also includes the chassis being treated with VpCI®-368.

**Date:**
March 2014

**Customer:**
Ground Control

**Location:**
Billericay

**Product Used:**
VpCI®-389D, VpCI®-101 emitters, VpCI®-105 emitters, VpCI®-132 foam pad emitters, VpCI®-415, VpCI®-239, VpCI®-369 and CorrLube™ Grease

# Trailer Storage

Artillery Systems had some trailers that required storage for approximately five years at MoD Stafford, whilst at the same time being protected from corrosion without the need for expensive Controlled Humidified Environment.

Although the equipment was to be stored for five years, the solution also needed to allow for the trailers to be placed back into operation at short notice if required.

The Artillery Systems Project team approached HITEK-nolo-gy Solutions Ltd (HSL) to provide a solution.

VpCI®-132 foam pads were placed in the back of the trailers, in and around the electrical leads, connectors and components etc. They were also placed on the outside of the trailers.

The MilCorr® was then laid out and the trailers placed on the Milcorr. The MilCorr® was then sealed into place and heat shrunk using a propane powered gas gun.

This treatment has resulted in the low cost storage of these assets for a period of up to five years.

Note: Although these trailers are stored inside a hanger, this same treatment could have been used if they were to be stored outside for the five years

**Date:**
June 2015

**Customer:**
Artillery Systems Project Team

**Location:**
MoD Stafford

**Product Used:**
VpCI® MilCorr® Shrink Film and VpCI®-132 Pads

# Viscount Fuselage

The National Museum of Flight, which is based at East Fortune near Edinburgh, is restoring two if its hangars and creating new exhibitions within them.
As a result of this redevelopment, a Viscount Fuselage was to be stored outside for a period of approximately one year.

HITEK-nology Solutions Ltd was approached by the Museum to provide a solution that would allow the fuselage to be stored outside, whilst at the same time being protected from corrosion.

VpCI®-132 foam pads were placed in and around the fuselage, this included the cockpit and seating areas.
VpCI®-126 HP UV Shrink Film was then placed around the fuselage and shrunk into place using a propane powered gas gun.

As a result of this treatment, Hitek-nology Solutions Limited was requested to go back to the Museum to also protect the wings for this aircraft with the same treatment as the fuselage.

**Date:**
December 2014

**Customer:**
Museum of Flight

**Location:**
East Fortune

**Product Used:**
VpCI®-126 HP UV Shrink Film and VpCI®-132 Foam Pads

# Imperial War Museum WW2 Tanks

The Imperial War Museum holds a vast array of important and historical military equipment. Only 5% of this equip-ment is on show at the museum in Duxford. The remain-der is stored in various types of hangers or left outside. This unfortunately leads to the equipment corroding and the potential loss of some of these historical equipments altogether. HITEK-nology Solutions Ltd was approached by the IWM to provide a solution that would preserve the equip-ments whilst in storage, and prove this with a subsequent trial on a Churchill Mk 7 Tank and a Matilda MK 2 Tank.

VpCI®-132 foam pads were placed both inside and outside of the tanks. The tanks were then wrapped in MilCorr® and heat shrunk. A low grade carbon steel plate was hung of each gun barrel. This would show first if any further corro-sion was taking place. Also, a MilCorr® zip door was fitted to the front of tanks to allow for ease of inspection. Further plates were fitted in the areas surrounding the tanks for comparison.

This has resulted in a low cost storage solution that will pro-tect the tanks from corrosion in all environments for period of five years.

**Date:**
October 2013

**Customer:**
IWM

**Location:**
Duxford

**Product Used:**
MilCorr & VpCI 132


# Steam Range Pipe Work

Certain types of submarines were having corrosion issues with steam range pipe work, resulting in premature failure of this very expensive pipe work. A MoD IPT approached HI-TEK-nology Solutions Ltd to provide a solution.

A minor trial was carried out using VpCI®-308. The MoD IPT provided a section of steam range pipe work and some used steam range feed water to be used for the trial. The pipe work was cut into three equal pieces and flushed with the feed water. One piece of the pipe was used as a da-tum piece, another piece was then part filled with the feed water and the remaining piece filled with feed water and VpCI®-308 added.

All three pieces were then left for six months (temperature was continually monitored and recorded twice daily). After six months the feed water was emptied from the pipes and independently tested by Keighley Laboratories who stated on their report that the addition of the inhibitor had elimi-nated any corrosion debris (rust) A full trial report includ-ing the independent report from Keighley Laboratories is available.


**Date:**
August 2007 – February 2008

**Customer:**
MoD IPT

**Location:**
Scunthorpe / Keighley Laboratories

**Product Used**
VpCI®-308

# UOP Gas Tubes

UOP manufacture gas tubes which are used world wide. Seven of these tubes had arrived in the UK from USA in a corroded state and were subsequently rejected by EXTER-RAN. UOP approached HITEK-nology Solutions Ltd (HSL) to provide a solution that would result in the tubes being reclaimed.

The internal volume of the tubes was soaked in VpCI®-422 to de-rust them. They were then soaked in 10% VpCI®-416 mix to clean / de-grease them. The ends were then removed to allow any waste and debris etc. to be removed, and the internal surface to be inspected and measured. The ends were then placed back on, and the internal volume of the tubes were treated with 20% VpCI ®-377 mix, to protect them from future corrosion prior to installation and use.

Upon inspection by UOP's inspector it was decided that two of the seven tubes could not be used, and would require re-honing. This was due to the amount of corrosion that had already happened; resulting in the internal surface having variations of more than 33 microns (only a variation of up to 33 microns was acceptable for gas to flow correctly). HSL had however managed to make five of the tubes re-usable, resulting in a saving of millions of US Dollars.

*Note: HSL were later requested to preserve the two failed pipes after re-honing.*

**Date:**
October 2007

**Customer:**
UOP

**Location:**
EXTERRAN Ltd, Walsall

**Product Used:**
VpCI®-422, VpCI®-416, and VpCI®-377

# HMS Albion

HMS Albion was entering a two year lay up period. This involves such things as removing, storing and then refitting high value assets such as Caley Davits, electric / hydraulic operated doors and various weather deck fittings. In addition a lot of the internal rooms are also fitted with expensive dehumidified equipment (DHE). Babcock's approached HITEK-nology Solutions Ltd (HSL) to provide a solution that would result in equipment being protected from corrosion in situ, whilst at the same time allowing the equipment to be placed back into use at short notice.

The internal volumes of the rooms were protected us-ing VpCI®-132 and VpCI®-137 foam any electric boxes within these rooms were also protected with VpCI®-105 / VpCI®-111 emitters. Any vents etc. within these rooms that were connected to other areas were treated with VpCI®-126 Blue film. Various external and internal elec-tric boxes were treated with VpCI®-105 and VpCI®-111 emitters.

A number of weather deck fittings were treated with VpCI®-369D aerosol. The Caley Davits, doors, LCVP units and various control units / bleed boxes etc. were treated with VpCI®-132 foam and MilCorr shrink film.

*Note: A full written report is available for this trial.*

**Date:**
March 2012

**Customer:**
Babcock International Group

**Location:**
Devonport Royal Dockyard

**Product Used:**
VpCI®-101, VpCI®-132 and VpCI®-137 foam, VpCI®-105 and VpCI®-111 emitters, VpCI®-369D aerosol, VpCI®-126 Blue film and MilCorr® shrink film

# HRSG & Package Boilers

A power station on the east coast of England was to be moth balled for the foreseeable future. The decision was taken to preserve the HRSG and two of the three package boilers, it was felt the third package boiler would never be brought back into service and therefore no point in preserving it.

Due to our work on other power station sites, HITEK-nology Solutions Ltd were approached to provide a solution that would result in the boilers being protected for up to two years from corrosion

All the boilers that required treating were treated with VpCI®-337. A low grade steel disc (provided by the power station) was hung in each boiler, this would be checked by the power station staff at the 12 month point for any signs of corrosion. This treatment has resulted in the low cost preservation of these extremely high value assets for a period of up to two years.

Eighteen months later, In June 2011, it was decided that the third package boiler was to be treated. HITEKnology Solutions Ltd, was requested to treat this package boiler in the same way as the others. At the same time one of the previously treated package boilers was to be opened and its disc checked. As can be seen opposite the disc was still in the same condition as when it was fitted.

**Date:**
December 2009 and June 2011

**Customer:**
Anon

**Location:**
East Coast of England

**Product Used:**
VpCI®-337

# Gas Pipes and Equipment

Unit Engineers & Construction Ltd on behalf of another company, carry out various tasks on gas pipes, approximately fifty of these pipes varied in length between 1m and 10m, with the internal diameter between 40cm and 70cm. This equipment is stored outside open to the elements causing internal corrosion of the pipes.

HITEK-nology Solutions Ltd was approached by the customer to provide a solution that protected the internal pipes and would still allow the equipment to be stored out-side prior to assembly, which could be for up to two years.

The pipe flanges were treated with VpCI®-389D and allowed to dry. The ends and various other openings on the pipes were then covered with VpCI®-126 and VpCI®-609s fogged into the internal volume of the pipes, resulting in a low cost anti-corrosion protection, whilst allowing the equipment to be stored outside prior to assembly.

**Date:**
July 2007

**Customer:**
Unit Engineers & Construction Ltd

**Location:**
Pembroke Dock, Wales

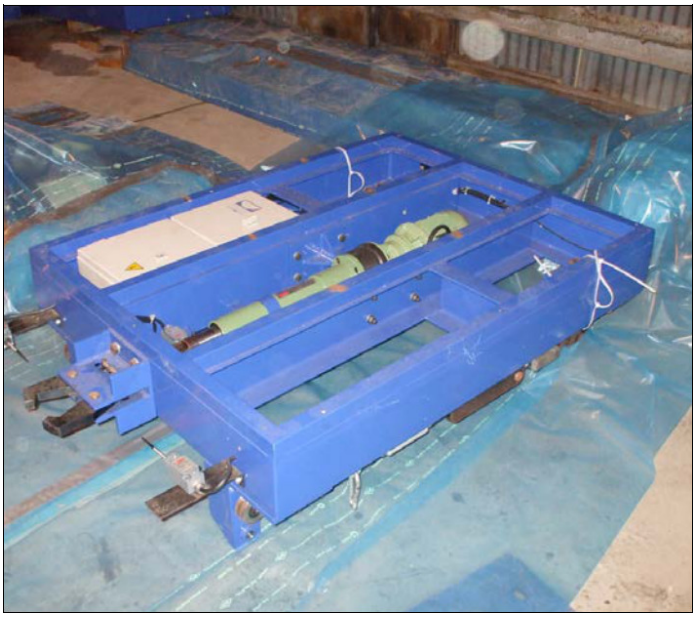
**Product Used:**
VpCI®-126, VpCI®-389D and VpCI®-609s

# Aircraft Test Decelerator

The RAF Accident Investigation Team, based at RAF Henlow had been donated a Crash Test Decelerator by Lloyds. Unfortunately due to various reasons the RAF were unable to immediately operate the Decelerator. The RAF wanted too store this high value asset for up to two years, in an aircraft hanger that is open to the wind and rain and therefore making the Decelerator susceptible to corrosion.

The RAF Accident investigation team approached HITEK-nology Solutions Ltd to provide a solution that would result in the Decelerator being stored for a period of up to two years in the aircraft hanger, whilst at the same time being protected from corrosion.

All the roller wheels, bearings, chains, hydraulics and oils were treated with VpCI®-329. All electrical con-nections and components were sprayed with VpCI®-238 (ElectriCorr®). All equipment was then wrapped in VpCI®-126 Blue with the relevant amount of VpCI®-132 foam pads inserted. This treatment has resulted in the low cost storage of a high value asset for a period of up to two years.



**Date:**
December 2007

**Customer:**
RAF, Accident Investigation Team

**Location:**
An RAF Base

**Product Used:**
VpCI®-126 Blue film, VpCI®-132 foam pads, VpCI®-238 (ElectroCorr®), VpCI®-329

# Land Rover Exhaust Manifolds

Hitachi Metals produce exhaust manifolds for Land Rov-er. 1300 of these high value manifolds had been packed in a well known manufacturers anti rust bags, but still rusted in transit and were rejected by the customer. It is a very expensive and time consuming task to reproduce the manifolds. Hitachi Metals approached HITEK-nology Solutions Ltd to provide a solution for reclaiming these manifolds.

The manifolds were de-rusted by soaking in a vat of VpCI®-422. Once de-rusted they were de-greased using VpCI®-416, and then placed back in the packing case, the pack-ing case was lined with VpCI®-126 giving the manifolds two years corrosion protection.

**Date:**
July 2009

**Customer:**
Hitachi Metals

**Location:**
Derby

**Product Used:**
VpCI®- 422, VpCI®-416, & VpCI®-126

• Hitachi Metals were so impressed with the results that they requested HSL reclaimed and treated a further 3500 Land Rover and Jaguar manifolds.

# Large Gas Cylinders

Oil & Gas Systems Ltd (O&GSL) put together large gas systems known as skids. Included in each skid is an enclosed large gas cylinder (approx size 3m tall and 1m diameter). Four of these cylinders had rusted inside and were deemed unacceptable by O&GSL customer. Therefore the skid could not be used until the cylinders had been derusted. Due to size and drainage issues large amounts of liquid could not be used or disposed of on site. HITEKnology Solutions Ltd was approached by the customer to provide a solution.

The internal surface of the cylinders were treated with VpCI®-423 Gel, this was then cleaned of with a 10% mix of VpCI®-415, resulting in a low cost solution that fulfilled local requirements and also gave a finish acceptable to Oil & Gas Systems Ltd and their customer.

**Date:**
May 2008

**Customer:**
Oil & Gas Systems Ltd

**Location:**
Swansea

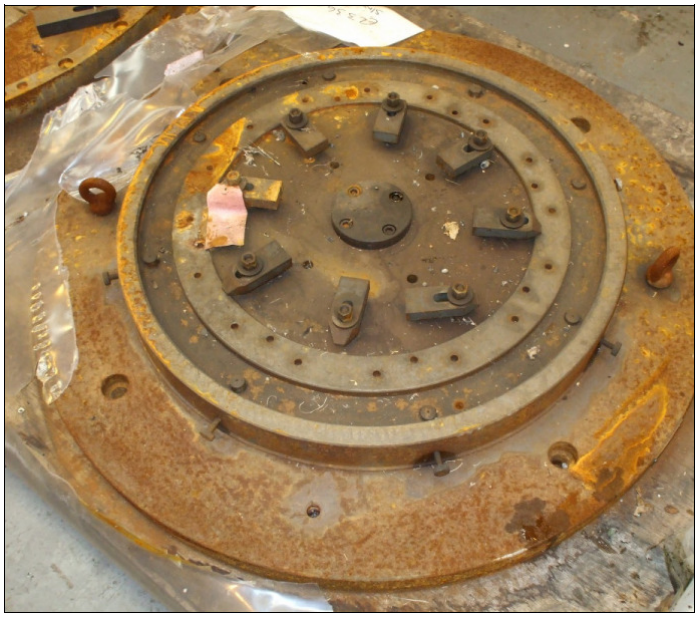
**Product Used:**
VpCI®-416 and VpCI®-423 Gel

# Jigs

Siemens had some redundant jigs etc. that were no longer used for making parts. These jigs had been left outside in a car park at one of their storage sites for just over two years and were badly rusted. Some of the larger parts had been shrink wrapped in plastic sheet, although most of these had wrapped and filled with rain water, the smaller parts had just been left outside in post pallets with no protection at all.

Another company were about to start producing the parts that required these jigs, so Siemens were asked to sell them; clearly they could not be used in this corroded state. HITEK-nology Solutions Ltd was approached by the cus-tomer to provide a solution that would bring the jigs back to an operational state, thereby allowing Siemens to sell them.

VpCI®-422 and VpCI®-423 were used to de-rust all the jigs etc. This was then cleaned off using VpCI®-416 resulting in a low cost reclamation of all the parts. No further protec-tion was required to prevent the parts corroding again as they were being immediately sent to the buyer by Siemens where they would be placed straight into operation.



**Date:**
September 2010

**Customer:**
Siemens

**Location:**
Lincoln

**Product Used:**
VpCI®-422, VpCI®-423, & VpCI®-416

# Gas Turbines

Siemens transport gas turbines worldwide after they have been built/refurbished at their Lincoln plant. Siemens were experiencing problems with corrosion in the oil sump (transported dry) and the bearings upon arrival at their destination. HITEK-nology Solutions was approached by the customer to provide a solution that protected the sump and bearings whilst still allowing the turbines to be transported world wide.

VpCI®-322 was fogged into the internal volume of the sump and the bearings resulting in a low cost anti-corro-sion protection, whilst both in storage before and during transportation. HITEK-nology Solutions has since been requested to treat more gas turbines. We also now protect all the electrical junction boxes with VpCI® Emitters and the Unison Rings (gearing System) with VpCI®-132 Foam Pads and VpCI®-126 Blue.

**Date:**
August 2007

**Customer:**
Siemens

**Location:**
Lincoln, England

**Product Used**
VpCI®-322, VpCI®-126, and
VpCI®-132 Foam Pads

# Six Month Preservation of Landing Crafts

Three LCVP MK5A landing crafts required corrosion protection for a period of approximately six months while being stored outdoors on land.

Babcock approached HITEK-nology Solutions Ltd (HSL) to provide a solution that would protect the equipment from cor-rosion while leaving it ready to be placed back into use at short notice and allowing access to all parts of the craft for any maintenance work required.

- The LCVPs were washed down with VpCI®-415.
- VpCI®-705 was added to the fuel; M-529 was added to the engine and gearbox oils; M-640 L was added to the coolant system; and VpCI®-322 was added to the hydraulic sys-tems. The engines were then run up for approximately 20 minutes.
- All electric junction boxes were treated with VpCI®-101 and 105 emitters.
- CorShield® VpCI®-368 was applied to all exposed bare metal, and CorShield® VpCI®-369 was applied to any exposed metal that also required lubrication (e.g., ramp rams).
- The engine compartment, well space, and wheel house were protected by inserting VpCI®-137 foam into the spaces.
- VpCI®-368 D was applied to the deck floor, and VpCI®-389 D was applied to the outside of the wheel house and the LCVP (as can be seen from the photo VpCI®-389 D goes on white, but dries clear).

HSL was able to provide an excellent strategy for thoroughly protecting LCVP external surfaces and engine compart-ments, electricals, and other system internals from corrosion during storage. The protection was designed in a way that would allow the LCVPs to be quickly put back into use when required.

**Date:**
March 2017 & November 2017

**Customer:**
Babcock International Group

**Location:**
Devonport Royal Dockyard, England

**Product Used**
VpCI®-101, 105 emitters, VpCI®-137 foam, VpCI®-322, VpCI®-415, VpCI®-368 D, VpCI®-389 D, VpCI®-705, M-529, M-640 L, CorShield® VpCI®-368 & 369 aerosols

# Multi-room Refrigeration Plant

Lightfoot Defence Ltd had manufactured a specialized Multi-Room Refrigeration Plant (MRP) that would be part of a multi-million pound refit of the Brazilian Navy's flagship aircraft carrier. The MRP was to be shipped by sea to Brazil and then stored there for up to five years before being fitted. The MRP needed to be protected from corrosion during shipment and storage, and periodic checks of gauges would be required during this time. HITEK-nology Solutions (HSL) was approached to provide a solution to the problem.

VpCI®-132 foam pads were placed around the air conditioning unit. VpCI® MilCorr® Shrink Film was then wrapped around the MRP and shrunk into place using a propane-powered gas gun. A zip door was fitted into the packaging to allow routine checks to be made and to facilitate changing of VpCI®-132 foam pads at the two year point.

This treatment has resulted in the low cost storage of this high value asset for a period of up to five years.

**Date:**
January 2017

**Customer:**
Lightfoot Defence

**Location:**
Fareham, England

**Product Used**
VpCI®-132 foam pads and VpCI® MilCorr® Shrink Film

# Drill Ship

Customer required their drill ship to be laid up hot, meaning the engines and some equipment would be operational, but the main drilling rig would be preserved and not in use.

- The risers were treated with VpCI®-337 and the ends sealed with VpCI®-126 HP UV Shrink Film.
- The bulk storage tanks, associated pipe work, and cement mixing tanks were treated with VpCI®-609 S.
- All electric JBs, motors, and monitors both internal and external were treated with VpCI®-101, 105, and 111 Emitters or VpCI®-170 tape.
- All lube oil and hydraulic systems that were to remain in use or with oil in them were treated with M 529, and all empty tanks and systems were treated with VpCI®-322.
- All exposed pistons and operating systems that required lubricating as well as protection from corrosion were treated with VpCI®-369 D.
- All rails and cranes with exposed metal were treated with VpCI®-368 D.
- Any exposed corroded metal where loose metal and rust was visible was cleaned up and treated with VpCI®-368 D.
- All exposed rusted metal that could not be properly cleaned had the loose rust brushed off and treated with CorrVerter®.
- CorrLube™ EP Lithium Grease was used on any area requiring grease.

**Date:**
January 2016 & May 2018

**Customer:**
V Ships Offshore

**Location:**
Teeside, UK

**Product Used**
VpCI®-126 HP UV Shrink film, VpCI®-101, 105 & 111 emitters, VpCI®-170 tap, VpCI®-322, VpCI®-337, VpCI®-368D, VpCI®-369D, VpCI®-609 S, VpCI®-645, VpCI®-649, CorrVerter, M529, CorrLube Grease

# Corrosion Protection of HMS Lancaster During Layup

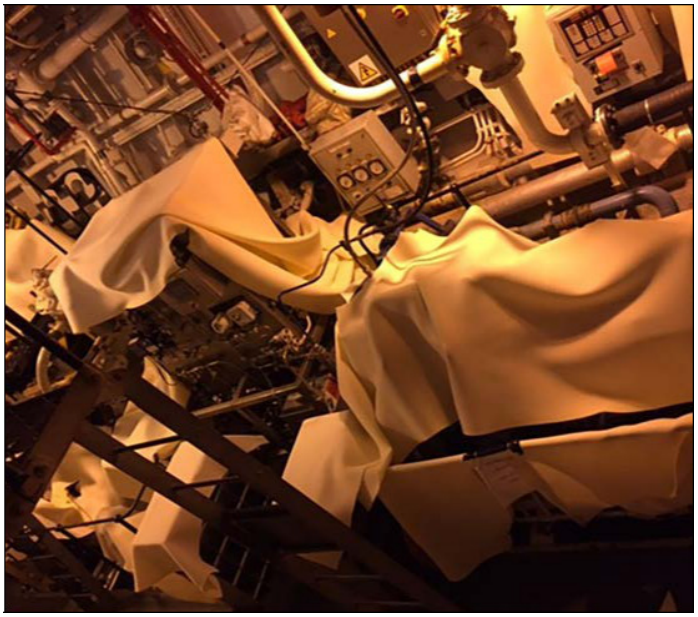
HMS Lancaster was entering a layup period in Portsmouth prior to being shipped to Plymouth for refurbishment. The front part of the ship was to have dehumidified equipment (DHE) installed. BAE approached HITEK-nology Solutions Ltd (HSL) to provide a solution that would protect various equipment and electrical junction boxes on the outer deck, as well as a large number of internal rooms and equipment within those rooms, against corrosion.

The internal volumes of the rooms were protected using VpCI®-137 foam. Various pieces of equipment within the rooms were treated with VpCI®-369 aerosol for both protection and lubrication. In some instances parts were stiff or seized, and these were treated with VpCI® Super Penetrant.

Various external electric boxes were protected by placing VpCI®-101 and 105 Emitters inside. Several exposed electrical cable ends on the outer deck and in the inner rooms were protected using VpCI®-126 bags.

A number of pieces of outer-deck equipment were treated with VpCI®-132 foam and wrapped using VpCI® MilCorr® shrink film, which was then heat shrunk into place. VpCI® Super Penetrant was used to loosen some seized hinges on deck. The Caley Davits and RAS winch motors were treated with VpCI®-369. Finally, covered outer deck walkways were cleaned with VpCI®-415 and treated with VpCI®-389D, a water-based, temporary coating alternative to oil-based products.

HSL was able to provide a practical, effective corrosion control layup system that would be relatively easy to remove when required. The VpCI® solution was able to revitalize frozen metal parts and was a simple way to protect intricate electrical systems from corrosion without requiring continuous monitoring.



**Date:**
August 2016

**Customer:**
BAE

**Location:**
Portsmouth Royal Dockyard

**Product Used**
VpCI®-101 and 105 Emitters, VpCI®-126 bags, VpCI®-132 and 137 foam, VpCI®-369D, VpCI®-369 aerosol, VpCI®-389D, VpCI®-415, VpCI® Super Penetrant, MilCorr® VpCI® Shrink Film

# Five-Year Preservation of Landing Craft

An LCVP MK5B required protection from corrosion for a period of up to five years of storage on land in an outdoor environment. Babcock asked HITEK-nology Solutions Ltd (HSL) for a solution that would protect the equipment from corrosion, while keeping all parts of the craft accessible for maintenance.

- The LCVP was prepared for preservation by washing it down with VpCI®-415.
- VpCI®-705 was added to the fuel, M-529 to the engine and gearbox oils, M-640 L to the coolant system, and VpCI®-322 to the hydraulic systems. The engines were then run up for approximately 20 minutes and removed for storage elsewhere.
- VpCI®-101 and 105 emitters were placed into electric junction boxes.
- All exposed bare metal was treated with CorShield® VpCI®-368, and any exposed metal that also required lubrication (e.g., ramp rams) was treated with CorShield® VpCI®-369.
- The engine compartment, well space, wheel house, and deck area were protected by placing VpCI®-137 foam inside.
- The LCVP was then wrapped in MilCorr® Shrink Film, which was heat shrunk into place. A MilCorr® zip door was then added so that access could be gained to all parts of the craft.

HSL provided an excellent long-term preservation solution that would protect the landing craft from corrosion while keeping all parts of the craft accessible. The preservation plan not only covered external surfaces, but also took into account the importance of protecting internal electrical, engine, and hydraulic systems.

**Date:**
June 2017, November 2018 & March 2019

**Customer:**
Babcock International Group

**Location:**
Devonport Royal Dockyard

**Product Used**
VpCI®-101, 105 emitters, VpCI®-137 foam, VpCI®-322, VpCI®-415, VpCI®-705, M-529, M-640 L, MilCorr® Shrink Film, CorShield® VpCI®-368 & 369 aerosols, CorrVerter, M529, CorrLube™ Grease

**HITEK-nology Solutions Limited**
15 Wentworth Road
South Park Industrial Estate
Scunthorpe
DN17 2AX
Tel: 01332 347175
Email: enquiries@hiteknologysolutions.co.uk
Website: www.hiteknologysolutions.co.uk