

ADVANCETM INSPECT

Ensure the integrity and determine the remaining service life of your plant's assets.



Stamicarbon
pure knowledge

ADVANCE™ INSPECT

The challenge

It is of great importance to plant managers to have the assurance that their equipment is safe, reliable and always available. Working with reliable equipment helps to prevent unsafe conditions and unscheduled plant stops.

Urea plants are designed for a particular service life, usually 20 years or more. However, corrosion properties of carbamate hold a serious threat to the integrity of urea process equipment. Therefore, corrosion may reduce the service life of urea plants significantly. As long as urea plants are well-maintained, well-operated and updated with state-of-the-art technology, the life time of the urea equipment can be extended beyond the design life and continue to produce urea safely and at a competitive cost.

Our Solution

Reliable and durable equipment are essential to the success of urea production. Therefore, Stamicarbon has developed several different plant integrity inspection services to ensure optimum performance and maximum lifespan of your urea process equipment, for example:

- 1) Urea Equipment inspection
- 2) High Pressure Piping inspection



We perform inspections on urea equipment and/or piping, based on a thorough understanding of the urea process, equipment design and failure modes. Stamicarbon can offer these services in all urea plants based on experience gained from 500 inspections executed over many years.

Benefits:

- Detailed management reporting on equipment condition, based on all measurements and findings
- Type and level of corrosion identified such as condensation corrosion, crevice corrosion, strain-induced cracking, stress corrosion cracking, stern-face corrosion
- Advice and recommendations on repairs and repair procedures
- Advice and recommendations on plant operations in relation to corrosion and damages
- Advice on scope and time interval for next planned inspection
- Equipment lifetime prediction and when follow-up action or replacement is due

The ADVANCE INSPECT inspection takes several days depending on the scope. The inspectors report findings on a daily basis and submit a field inspection report with main conclusions and advice to management before leaving the site. This is followed by a final report with root-cause findings if applicable.

Why HP Equipment Inspections?

Plant Operations can be severely interrupted and even cause serious safety risks and fatal accidents that could have been prevented with a proper HP Equipment Inspection program.

Case 1: Near miss catastrophic failure of urea reactor



08:30h
November 5th, 2015



12:30h
November 5th, 2015

The case

During the daily round, the plant operator observed crystallized product contamination on the outside of the urea reactor. The plant was stopped within one day to open up the reactor for inspection. A leak was observed in a liner weld and upon removal of the liner plate, severe corrosion of the pressure shell was observed. The plant was stopped just in time to prevent a catastrophic failure. The corrosion damage was repaired and the reactor was put into service again safely.

The cause

The leak was caused by a defect in a liner weld, which was missed during routine inspections. Unfortunately, the leak detection system was out of order and the unavailability of the leak detection system worsened the situation to near-catastrophic.

Lessons learned

Small invisible defects are potential threats to the structural integrity of critical HP urea equipment. So in addition to scrupulous inspections by experienced inspectors, the final line of defense (leak detection system) should also be checked and maintained properly.

Case 2: Catastrophic failure of HP Scrubber



Ruptured HP Scrubber

The case

During normal operations, suddenly the High Pressure Scrubber ruptured and caused quite some damage to the structure. Fortunately, nobody was injured.

The cause

A small leak in a patch plate weld on the liner was not noticed and created severe corrosion in the c-steel pressure shell resulting in the rupture of the vessel. The root cause of this mishap is the combination of:

- 1) The patch plate was not inspected on regular basis.
- 2) The leak detection system was not available.

Lessons learned

Inspection of critical high pressure urea needs to be done on regular basis. Furthermore a good functioning and maintained leak detection system is of paramount importance as last line of defense to avoid catastrophic failure.

ADVANCE INSPECT™ Urea Equipment

The critical urea equipment inspection is performed by our experienced corrosion engineers and non-destructive testing (NDT) experts, on both high pressure synthesis and low pressure equipment.

ADVANCE INSPECT™ High Pressure Piping

Stamicarbon executes lifetime assessments of the high pressure (HP) piping and accessories.

The approach is based on the Risk Based Inspection methodology (RBI), meaning that all the components will be ranked critically from the process and atmospheric point of view. In this way the most critical points in the pipe system are identified and target the inspection program.

With Stamicarbon, you can rely on:

- A combined knowledge of process design, material science and fabrication techniques, resulting in a perfect position to execute inspections utilising these three disciplines
- A long-lasting experience when it comes to inspection services, enables us to know where to look for critical parts of your plant

"The inspectors have both been exceptional. They have very high standards and have worked well with us and our welding company to ensure that we are getting the best repair possible."

- Pryor Chemical

"Stamicarbon successfully performed an inspection on our high pressure equipment. The report we received provides a complete picture of the status of our high pressure equipment, and also its weak points, for which Stamicarbon provided valuable recommendations. We greatly appreciate the cooperation and support received from Stamicarbon."

- Sorfert