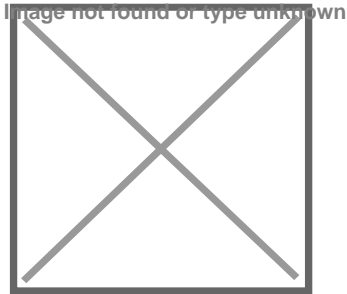


# Non-intrusive risk based inspection

---



Christophe Baete  
Vaartdijk 3/603  
3018

[www.elsyca.com](http://www.elsyca.com)  
+32 16 47 49 60

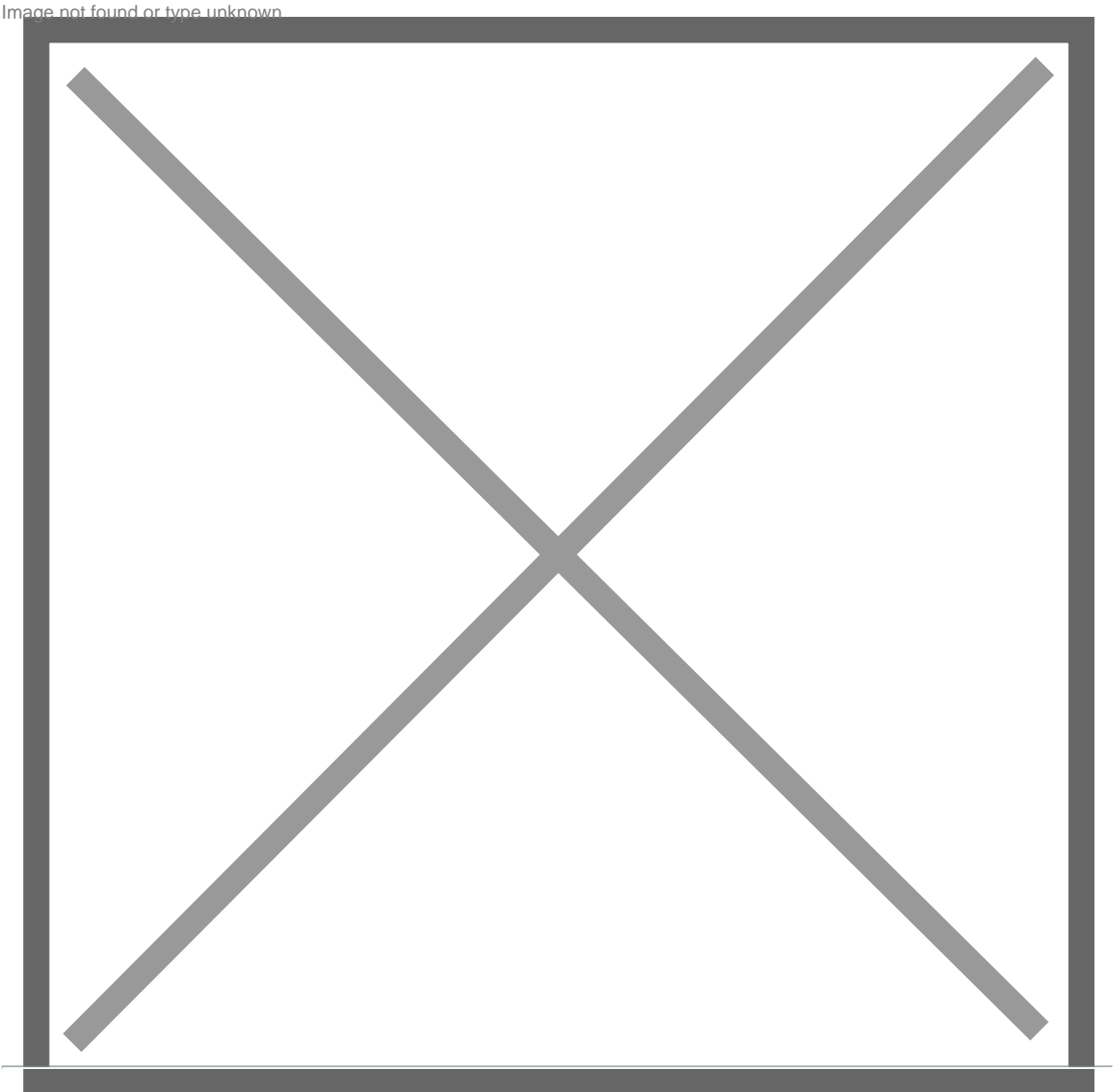
---

## De Challenge

Tank bottoms are subjected to corrosion from the inside due to the stored product and water/condense fraction, and from the outside due to a wetted soil pad. Conventional periodic inspections around the tank cannot provide sufficient information on the prevailing corrosion condition and corrosion rate of the entire tank bottom plate. Today there is a lack of assessment techniques for justifying inspection intervals in risk based inspection programs. As a consequence tanks are shut down, emptied and rinsed for internal inspections and repair costing the industry millions of euros.

## De Solution

A non-intrusive risk based inspection technique is proposed that combines computational modelling with NDT scans based on EMAT (Electro Magnetic Acoustic Transducer). The EMAT sensors are placed on the outside of the tank and scans the internal and external metal loss of the annular ring for the full circumference of the tank bottom plate. The corrosion pattern in the B-scan is used in computational corrosion simulations resulting in accurate calculation of corrosion rates of the full tank bottom plate. The computational model requires water and/or soil samples for updating the corrosiveness of the environment. Based on the current metal loss scans and corrosion rate simulations, the remaining mechanical strength of the storage tank is modeled as well. As a result re-assessments intervals are better defined and the remaining life time more accurately predicted. [Watch the innovation pitch from Elsyca nv here](#)



Tank terminals and other storage facilities aim to keep tanks close as long as possible but in a justifiable way. Typical tank outage incurs economical losses due to reduction in production, UT scanning and repair costs, with total costs ranging from \$45,000/day and 3.1% of the annual gross profit.

This non-intrusive risk-based inspection approach based on advanced NDT and computational modeling technology offer a better justification when tanks need to be inspected and opened resulting in significant cost savings.

In a summary the following benefits are achieved:

- Monitoring the corrosion and mechanical health status of the tank
- Determining inspection intervals and time for repair
- Applicable for all type of tanks and products regardless of the presence of historical data
- Modeling cathodic protection design requirements if needed