

■ **Course title:**

Extensive 2 Days Masterclass - Corrosion Under Insulation (CUI); Atmospheric Corrosion

■ **Introduction:**

In this extensive, 2 days, masterclass the different forms of CUI (atmospheric corrosion) and the parameters affecting these corrosion phenomena are explained and elaborated by means of numerous case histories. The measures to mitigate CUI are outlined in the several phases of plant life: design, construction, and operation/maintenance phase. It is emphasized that inspection on CUI based on an RBI philosophy is required to set up a predictive maintenance program to ensure continuous safe plant operation.

Duration 12 hours

■ **Course outline:**

Module 1: Forms of CUI

1. Introduction.
2. Forms of CUI (atmospheric corrosion):
 - a. Carbon steels:
 - Crater-type attack.
 - Nitrate SCC.
 - b. Stainless steels:
 - Chloride SCC.
 - Intergranular attack.
 - c. Non-ferro alloys (Al-, Cu-alloys):
 - Galvanic corrosion.
 - NH₃- SCC.
3. Case histories of different forms of corrosion.

Module 2: Forms of CUI and Parameters

1. Parameters influencing/promoting CUI:

Author(s) / Trainer(s):



Giel Notten

Materials & Corrosion Engineer,

Giel Notten is a materials and corrosion expert who, spent thirty-eight years working with DSM in The Netherlands. After gaining his Chemical Engineering degree he joined DSM's Materials and Corrosion Department and was heading this Department as Managing Senior Corrosion Engineer. In this job he was involved in a broad range of consultancy activities for numerous (petro-)chemical plants. For Stamicarbon, a previous subsidiary company of DSM, and licensing DSM's know-how, he set up programs for lifetime assessment studies, based on RBI philosophy, in numerous urea and ammonia plants and supervised these studies. Giel was also involved in the development of Safurex[®], the super-duplex stainless steel grade (developed by Sandvik in cooperation with Stamicarbon) for application in Stamicarbon urea plants.

He was a board member of NACE Benelux and a member of the Contact Group Corrosion of the Dutch Chemical Process Industry.

Since his retirement from DSM, Giel started his own company NTT Consultancy in 2006 and has remained active as a materials and corrosion engineering consultant for many companies all over the world. He has devoted much of his time to passing on his knowledge and experience on the topic of corrosion engineering to a new generation of engineers in corrosion courses and trainings; numerous trainings have been presented. In cooperation with UreaKnowHow (in-house) training sessions have been organized and presented to more than 1000 urea engineers, managers, (shift-) supervisors and operators from all over the world. Several workshops have been presented in cooperation with UreaKnowHow for CRU in Nitrogen & Syngas Conferences.

Giel published many technical papers in reputable industry magazines and collected his knowledge and experience, illustrated with numerous cases of corrosion, in a book entitled Corrosion Engineering Guide.

giel.notten@gmail.com

- a. Macro and micro climatic conditions.
 - b. Materials of constructen.
 - c. Temperature.
 - d. Types of insulation.
 - e. Design aspects.
 - f. Case histories related to (wrong) design.
2. Economics and safety aspects.

Module 3: Measures to mitigate CUI

1. Introduction.
2. Measures in design phase:
 - a. Application of international standards.
3. Measures in construction phase.
4. Measures in operation/maintenance phase.
5. Organic coating systems (paints) versus metallic coatings with cathodic protection properties.
6. Protection of bolting and screwed joints.

Module 4: Inspection on CUI

1. Introduction.
2. Asset management of chemical process plants.
3. Inspection on CUI based on RBI philosophy.
4. Drawing up CUI inspection programs.
5. Inspection techniques used for CUI.
6. Conclusions and recommendations.

Learning outcomes:

By the end of this training course you will understand:

- That CUI is a real threat for safe operation of (especially older) chemical process plants.
- Which parameters will promote the occurrence of CUI.
- How to mitigate CUI in the several phases of plant life.
- How to draw up a CUI inspection program to support a predictive maintenance which is a prerequisite for safe operation of your plant.

Who will benefit:

Employees who are responsible or share responsibility with respect to the mechanical integrity and safe operation of process plants: process, mechanical, maintenance, corrosion and inspection engineers employed in all kinds of (petro-)chemical process plants.

■ **Course materials:**

- Hand-out presentation slides in PDF format

■ **Price:**

€1.200.00

■ **Discounts:**

- 2 places – 10% discount
- 3 places – 15% discount
- 4 or more places – 20% discount.

■ **In-company training:**

This course is also available as an in-company course (face-to-face or online) where content can be customised to meet your organisation's specific needs and delivered on a date/location that suits your requirements.

[Contact us](#) for more information.

■ **Training code: MAT04**

On request the electronic (recently revised) version of the Corrosion Engineering Guide (> 800 pages) is available for additional costs of **€95.00**

