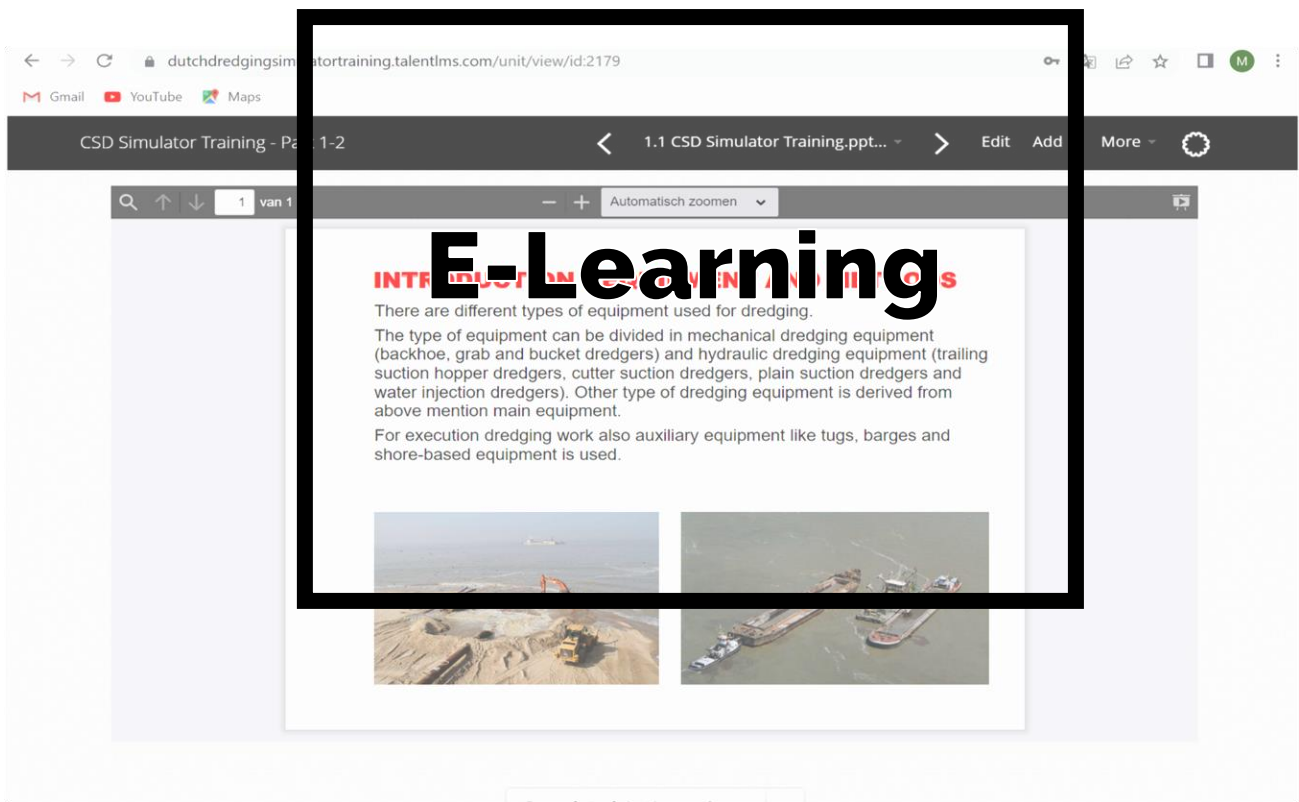


# DUTCH DREDGING SIMULATORS

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**Dutch Dredging Simulators** is providing E-learning modules about cutter suction dredgers (CSD). The E-learning is web-based and the modules can be done on the students own computer and in his/her own environment.

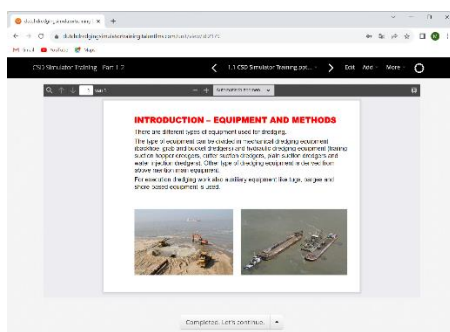
The CSD E-learning course can be done for different levels of experience and knowledge:

- Basic course
- Advanced course
- Professional course

A test can be done after studying of the course material. In case sufficient points are earned, a certificate is obtained.

The **basic course** covers dredging in general, the cutter suction dredger in particular, and contains the following subjects:

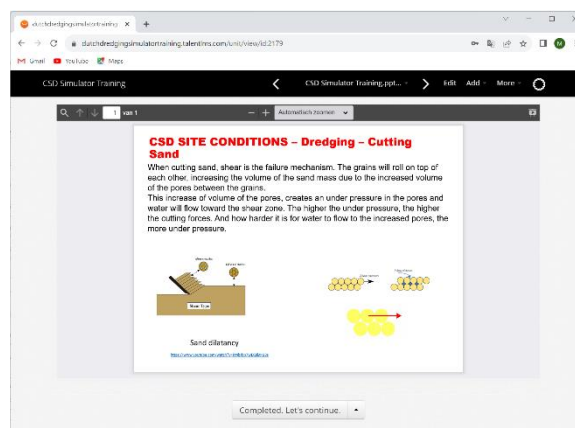
- Different types of dredging equipment and methods (trailing suction hopper dredger, cutter suction dredger, plain suction dredger, etc.).
- Types of cutter suction dredgers.
- Various components and parts of the CSD (such as cutter head, spud carriage, anchor booms, pump, pipeline, etc.).



Basic course

The **advanced course** covers the operation of the CSD and the relevant site conditions in respect to the dredging process:

- CSD operation; swinging, working on spuds (fixed spuds, spud carriage), positioning of anchors, cutting plan, discharge area.
- Soil types and the relevant properties for dredging.
- Sea state.
- The effect of the soil on the gathering process, cutting process, pumping process.
- The centrifugal pump; pump curves, pipeline characteristics.



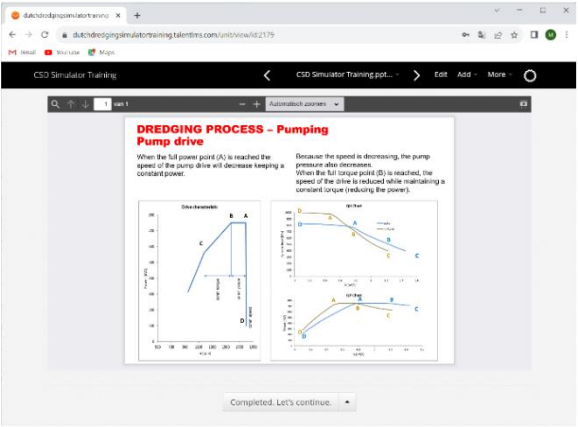
Advanced course

The **professional course** goes deeper into the dredging processes and focusses on optimization of the output of the CSD.

All the knowledge from the previous levels is applied to enable maximization of the production. Practical situations are explained with the theory. Finally a connection is made with readings of the

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instruments and control consoles of the CSD simulator, and actions to be taken to improve the production.



Professional course

### Hands-on CSD simulator training

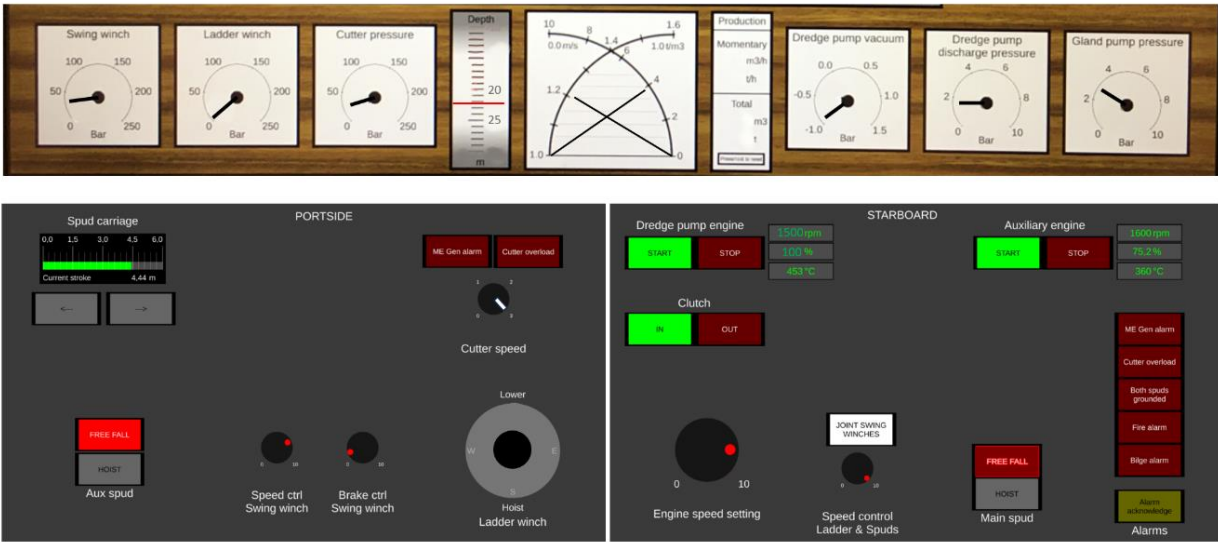
Since the CSD simulator is a mobile set-up, training can also be provided at a location chosen by the customer with assistance of an experienced dredge master and/or trainer. The trainee is able to exercise the operation of the CSD with different lay-outs of the controls (controls in desks, or controls integrated in joysticks), different soils, and assisted by a trainer and/or dredge master.



CSD Simulator training on location

### CSD Simulator

The E-learning can be combined with simulator training. The combination of the two will be an effective way to increase the knowledge and skills of personnel.



You are operating with the above readings on the instrument panel and settings at the control desks.  
 The material dredged: sand  
 Hardness: SPT value 15  
 Pipeline length: 1000 m

What can or should you do to improve the performance?

- Increase swingspeed
- Lower cutter ladder
- Check cutter head for blockage
- Increase pump engine speed
- Lower pump engine speed
- Increase brake force swing winch
- Lower cutter speed
- Increase step with spud carrier