疏浚与生态更和谐

Enhance the Harmony between Dredging and Ecology

第22届世界疏浚大会短期培训课程安排

The 22nd World Dredging Congress
Short-term Training Course Arrangement

授课日期：2019年4月22日

Course Date: April 22, 2019

时间 Time	课程名称 Course Title	授课专家 Expert	课时 Class	教室 Remarks
8:00-12:00	Ⅰ.使用代尔夫特水头损失&极限沉积流速框架 Ⅰ.Applying the Delft Head Loss & Limit Deposit Velocity Framework	Sape A. Miedema	4	A
14:00-18:00	Ⅱ.泥泵应用和操作 Ⅱ.Dredge Pump Application & Operation	Robert Visintainer	4	A
8:00-12:00	Ⅲ.耙吸式挖泥船泥舱沉积过程 Ⅲ.The TSHD Sedimentation Process	Cees van Rhee	4	B
14:00-18:00	Ⅳ.挖泥船信息化技术与精确疏浚 Ⅳ.Dredger Information Technology and Precise Dredging	俞孟蘗 Yu Menghong	4	B

注：授课地点请关注《第22届世界疏浚大会会议指南》

Note: Please pay attention to the *Guide to the 22nd World Dredging Conference*

Cees van Rhee
教授
Professor
代尔夫特理工大学
Delft University of Technology

自1985 年以来，Cees van Rhee 教授一直致力于疏浚行业的研究。开始的5 年，在代尔夫特水力学所（目前为Deltares）工作，1990 年至2007 年在疏浚承包商范奥德（Van Oord）公司工作。2002 年底，获得博士学位（CumLaude）。自2004 年至2007 年底，他担任范奥德公司疏浚研究部门的负责人。自2007 年10 月起，他担任代尔夫特理工大学（TU Delft）疏浚工程系的全职教授。

Since 1985 Cees van Rhee has been engaged with research for the dredging industry. The first five years at WL|Delft Hydraulics (presently Deltares) and from 1990 to 2007 at Van Oord, a dredging contractor。 End of 2002 the author obtained his PhD degree (Cum Laude). From 2004 - end 2007 he was head of the Dredging Research dept. of Van Oord Dredging and Marine Contractors. Since October 2007 he is full professor Dredging Engineering at Delft University of Technology.

耙吸式挖泥船泥舱沉积过程
The TSHD Sedimentation Process

Cees van Rhee

耙吸式挖泥船装舱过程中最重要的过程之一是沉积过程，因为它会影响产量、沉积物质量和环保问题。在本课程中，处理泥沙的沉积过程基于模型，该模型可用于计算沉积过程和溢流损失。

One of the most important processes during loading of a TSHD is the sedimentation process since it influences the production, sediment quality and environmental issues. In the course fundamentals of the sediment settling process are treated as well as models that can be used to compute the sedimentation process and overflow losses.

Sape Andries Miedema
疏浚工程副教授
Associate Professor Dredging Engineering
代尔夫特理工大学
Delft University of Technology

Dr.ir. S.A. Miedema（出生于1955年11月8日）在1983年获得代尔夫特理工大学（TUD）机械工程硕士学位。1987年，他获得了与船舶运动相关的土壤研究博士学位。现任代尔夫特理工大学海上疏浚工程教育主任，疏浚工程副教授。

Dr.ir. S.A. Miedema (November 8th 1955) obtained his M.Sc. degree in Mechanical Engineering with honours at the Delft University of Technology (TUD) in 1983. He obtained his Ph.D. degree on research into the basics of soil cutting in relation with ship motions, in 1987.Now he is the educational director of offshore and dredging engineering in Delft University of Technology, associate professor of dredging engineering.

使用代尔夫特水头损失&极限沉积流速框架
Applying the Delft Head Loss & Limit Deposit Velocity Framework

Sape Andries Miedema

在疏浚中，从技术和科学角度来说，泥浆输送是最重要的过程之一。基本上泥浆输送用于将固体从A输送到B。

为了设计这样的运输系统，必须要回答许多问题。首先，我们有几何参数，比如输送距离和高度、管道直径是多少。其次，我们有操作参数，比如所需的流量或流速（线速度），所需的总压力是多少。第三，输送浆体的性质，比如粒径和PSD、体积浓度、固体密度等。

基于这些输入参数，可以确定用流速和浓度计算水力梯度的公式。一旦知道了这个，就可以选择泵、型号和数量。

In dredging, slurry transport is one of the most important processes, both technologically and scientifically. Basically slurry transport is used for the transportation of solids from A to B.

In order to design such a transport system, many questions have to be answered. First of all we have the geometrical parameters like, what is the transport distance and elevation, what will be the pipe diameter. Secondly we have operational parameters like, what is the required flow or flow velocity (line speed), what is the total required pressure. Thirdly the properties of the material to be transported like, the particle diameter and the PSD, the volumetric concentration, the solids density, etc.

Based on these input parameters the hydraulic gradient can be determined as a function of the flow velocity and the concentration. Once this is known one can choose pumps, type and number of.

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该课程将根据可用的DHLLDV书（1000页）和Excel工作簿（超过40个选项卡）来展示设计过程。

该课程包括：

- 水力梯度和固体效应曲线，由管径、粒径和体积浓度构成的公式
- 空间和输送体积浓度之间的差异
- 分级固体的水力梯度和固体效应曲线
- 粒径、管径、倾斜角度、体积浓度和固体密度的敏感性
- 极限沉积流速（DHLLDV）与静止沉积流速的极限（Wilson）的比较
- 浓度分布
- 一个案例

The course will showcase the design process based on the available DHLLDV books (1000 pages) and Excel workbooks (more than 40 tabs).

The course includes:

- Hydraulic gradient and solid effect curve, a formula consisting of tube diameter, particle size and volume concentration
- The difference between space and transport volume concentration.
- Hydraulic gradient and solid effect curve of graded solids
- Sensitivity to particle size, tube diameter, tilt angle, volume concentration, and solid density
- Comparison of limit deposition flow rate (DHLLDV) with the limit of static deposition flow rate (Wilson)
- Concentration distribution
- A case

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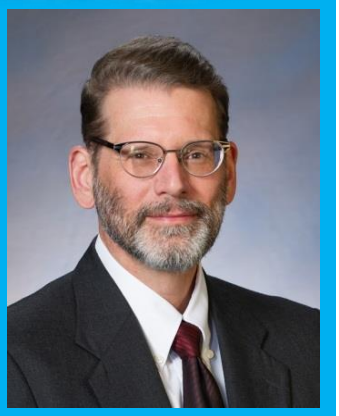

Robert Visintainer

副总裁

Vice President

GIW工业公司工程部和研发部

Engineering and R&D, GIW Industries

自1981年以来，Robert一直从事离心泵的设计、测试、销售和制造，尤其专注于泥浆泵的液压和机械设计。目前担任全球泥浆和固体输送技术领先者GIW工业公司的工程部和研发部副总裁，负责产品设计、材料开发和GIW独有的泥浆水力测试实验室。

Robert has worked in the design, testing, sales and manufacture of centrifugal pumps since 1981, with special focus on slurry pump hydraulic and mechanical design. He currently serves as V.P. of Engineering and R&D for GIW Industries, Inc., a world leader in slurry pump and solids transport technology, with responsibility for product design, materials development, and GIW's unique Slurry Hydraulic Test Lab.

泥泵应用和操作

Dredge Pump Application & Operation

Robert Visintainer

时长4小时的课程将会讲述在疏浚应用中，离心泵的设计、性能、选型、操作和问题解决。课题将会 包括泥泵设计、液压性能、泵-系统相互作用、吸口性能、泥浆固体效应、磨损和材料、瞬态条件和多种泥泵系统。

This 4-hour course provides an introduction to the design, performance, selection, operation and troubleshooting of centrifugal slurry pumps in dredging applications. Topics covered include slurry pump design, hydraulic performance, pump-system interactions, suction performance, slurry solids effect, wear and materials, transient conditions, and multiple pump systems.

2019.4.22-26上海

教学大纲：

- 泥泵基础
  - 理论与实践
  - 设计和制造
  - 性能曲线
  - 泥泵-系统相互作用
- 泥泵磨损性能因素
  - 操作条件
  - 设计考虑
  - 液压效果
  - 材料
- 吸口性能
  - 空化
  - NPSHA and NPSHR
  - 设计因子
- 土对泥泵性能的影响
  - 沉降泥浆
  - 非沉降泥浆
- 瞬态操作和故障排除
  - 启动和关闭
  - 多泥泵系统
  - 水锤
  - 系统稳定性

Syllabus:

- Slurry pump basics
  - Theory vs practice
  - Design and construction
  - Performance curves
  - The pump-system interaction
- Pump wear performance factors
  - Operating conditions
  - Design considerations
  - Hydraulic effects
  - Materials
- Suction performance
  - Cavitation
  - NPSHA and NPSHR
  - Design factors
- Solids effect on pump performance
  - Settling Slurries
  - Non-Settling slurries
- Transient operation and troubleshooting
  - Startup and shutdown
  - Multiple pump systems
  - Water hammer
  - System stability

俞孟蕈
Yu Menghong
教授，副校长
Doctor of Engineering, Professor
江苏科技大学
Jiangsu University of and TechnologyScience

主要从事控制理论与控制工程领域教学与科研。主持和参与了中国国家发改委科技攻关项目、国家重大科技成果转化项目和科技部、交通部、江苏省重大科技研究项目等。先后获国家技术发明二等奖及省部级科技进步特等奖等奖项,中国疏浚协会技术专家委员会委员。

Mainly engaged in the teaching and research of control theory and control engineering. He presided over and participated in the scientific research project of China National Development and Reform Commission, the national major scientific and technological achievements transformation project, the Ministry of Science and Technology, the Ministry of Communications, and major scientific research projects in Jiangsu Province. He has won the second prize of National Technology Invention and the Provincial and Ministerial Science and Technology Progress Award,member of Technical Expert Committee of China Dredging Association.

挖泥船信息化技术与精确疏浚
Dredger Information Technology and Precise Dredging

俞孟蕈
Yu Menghong

挖泥船精确疏浚控制技术是高效、绿色、自主疏浚技术及先进疏浚装备的核心内容及构成。基于近二十余年来中国疏浚及装备技术发展，简要梳理挖泥船信息化技术与精确疏浚技术的发展进程，阐述挖泥船信息化技术与精确疏浚技术的任务目标，分析挖泥船集成控制系统与精确疏浚的技术体系，重点介绍挖泥船计算机辅助决策系统、挖泥船功率管理系统、挖泥船DTPM系统、挖泥船远程监控与调度系统、挖泥船动力定位与动态跟踪系统的构成及其持续进阶的关键技术，简述智能疏浚技术特征、智能挖泥船关键技术及其实现途径。

Precise dredging control technology is the core of the efficient, green, autonomous dredging technology and advanced equipment. In view of the rapid development of dredging technology in China for more than 20 years, the course first introduces the development of dredger information technology and precise dredging, expounds the mission objectives of dredger information technology and precise dredging, and analyzes the dredger integrated control system and the technical system of precise dredging, focusing on the computer aided decision-making system of dredger, power management system of dredger, DTPM system of dredger, remote monitoring and dispatching system of dredger, dynamic positioning and tracking system of dredger. The features of intelligent dredging technology, the key technology of intelligent dredger and the way to realize it will be briefly described.

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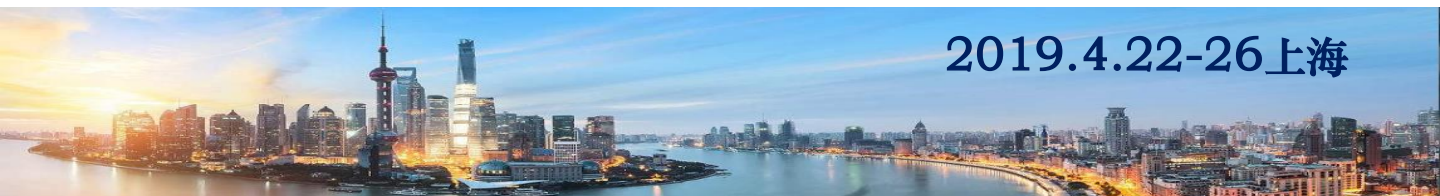
教学大纲：

- ●基于中国现实进程的挖泥船信息化技术概述
- ●挖泥船信息化技术与精确疏浚任务目标
  - ○精确疏浚与精确控制定义
  - ○挖泥船信息化技术与精确疏浚任务目标
  - ○基于精确控制的挖泥船信息化技术应用要点与技术基础
- ●挖泥船信息化关键技术系统
  - ○挖泥船集成控制系统与精确疏浚
  - ○挖泥船计算机辅助决策系统
  - ○挖泥船功率管理系统
  - ○挖泥船DTPM系统
  - ○挖泥船远程监控与调度系统
  - ○挖泥船DTDP系统
- ●智能疏浚技术与智能挖泥船发展
  - ○智能疏浚技术特征
  - ○智能挖泥船关键技术及基本途径
  - ○挖泥船智能疏浚自动控制系统



Syllabus:

- Overview of dredger information technology based on China's real process
- Dredger information technology and precise dredging mission objectives
  - Precise dredging and precise control definition
  - Dredger information technology and precise dredging mission objectives
  - Application points and technical basis of dredger information technology based on precise control
- Dredger information technology key technology system
  - Dredger integrated control system and precise dredging
  - Dredger computer aided decision system
  - Dredger power management system
  - Dredger DTPM system
  - Dredging vessel remote monitoring and dispatching system
  - Dredger DTDP system
- Intelligent dredging technology and development of intelligent dredger
  - Intelligent dredging technology features
  - Key technologies and basic approaches for intelligent dredgers
  - Dredger intelligent dredging automatic control system