



Very much alive – A challenge –
Cees van Rhee



Anders Jensen



Work in progress Baseline study –
Peter Hinchliffe



Tiedo Vellinga



Formula – Robert van de Ketterij



Stop and start – Bart Callaert

Nostalgia? Not Here!

Hard on the heels of CEDA's highly successful first foray into Russia, we were back in Rotterdam for November's traditional Dredging Days conference and technical exhibition – and even after 20 years it's as fresh as ever, reports **TONY SLINN**



Held in conjunction with *Europort* at Ahoy from 4 to 6 November and themed *Dredging Tools for the Future*, the “Dredging Days concept is still very much alive if we're to judge from the number of abstracts submitted by potential speakers,” said CEDA Technical Papers Committee chairman **Professor Cees van Rhee** in his programme outline.

It was a sentiment echoed by CEDA president **Anders Jensen** in his introduction. “Tightening of international regulations is, as ever, a challenge for the industry,” he stated,

“and it's why Dredging Days is so important in helping to shape the projects of future.”

Those challenges were the subject of **Peter Hinchliffe's** keynote speech, and as marine director of the International Chamber of Shipping (ICS), he took a shipowner's stance in outlining them.

“I'm particularly pleased that the European Dredging Association (EuDA) has recently become a member,” he said, explaining that ICS now has 33 national shipowners' associations as members, representing about 75% of the world's tonnage. “New regulations are shipowners' greatest concern and

I'm mostly going to concentrate on environmental impacts.”

His presentation looked at regulatory issues covering ship recycling and especially air pollution combined with climate change issues.

“All was well until people started to worry about sulphur content, especially when ships were in port,” he said, detailing the 2010 revised Marpol Annex VI and its likely impacts, including emission control areas and fuel availability.

“By 2020, all ships in major trades will be burning distillate fuel,” Hinchliffe predicted. “ICS is working



Wrecks & bombs
– Steen Lykke



€uros per m³ – Jop Paauw



Force needed – Roeland Neelissen



Adapt to site – Laurens de Jonge



Underwater noise – Politie Laboyrie



Do your best – Bert Kips



Oranje rainbowing at Maasvlakte 2, site of Dredging Days' technical visit – see page 32

with IMO to consider the impact this will have on fuel availability. But we've had very little interest and it remains a work in progress."

Turning to climate change, he told delegates: "Ships are unjustifiably viewed as dirty polluters contributing to climate change." But as he pointed out, ships carry 90% of the world's trade and carbon dioxide levels are just 2.7%. "By any account, that's an efficient trade mechanism, but shipping will do better," he said.

Concluding, he looked at likely impacts for the dredging community: sea level rises, surveys and charting,

plus navigational channel dredging. "When we start to think through sea level rises properly, we will see that the time to start planning for it is already with us," he stated.

FIRST SESSION

With the theme *Dredging Tools and Increasingly Stricter Environmental Regulations*, and with CEDA board member and Dutch Section president **Johan Pennekamp** in the chair, Session One kicked off with **Stany Pensaert's** view of optimising the storage capacity of tailing ponds.

Outlining today's problems in

finding space and planning permission for disposal areas, the DEMA Environmental Contractors engineer used a case study of zinc smelter Nyrstar Balen in Belgium to illustrate how mechanical dewatering could be effective. First dredged using a Damen DOP pump, the material – mainly goethite and gypsum – was dewatered using switchable presses.

"The final result will be a 100% reduction in volume," he said. The cost was about €40 per ton of dry matter, but: "If you can win very expensive volume by doing that, it's worth it."

Professor Tiedo Vellinga took the



Happy position – Not pessimistic
Peter Lundhus – Koos van Oord



EuDA's view –
Paris Sansoglou



Experimental –
Frederik Vinke



Turbulence –
Joost Mol



High velocity –
Rik Bisschop

floor with a study of environmental monitoring before and during Maasvlakte 2's construction (see separate story on pages 32–33). In addition to turbidity and sedimentation during dredging, the programme included measurements of dredgers' underwater noise during both sailing and rainbowing. "We'll have the results by the end of 2009," he promised.

"We're dredging across three ice ages for the first time in the Netherlands," he continued, listing finds that include mammoth bones. "What I find most rewarding is that we're creating new knowledge for future projects, including EcoShape and Building with Nature."

The environment, and matching the dredging industry's needs with IMO's carbon dioxide-reduction measures, was also IHC Merwede's Dr Robert van de Ketterij's focus.

"We went to the IMO and pointed out their formula concentrates on a reduction in power, not actual fuel consumption," he opened. "Our objections include the facts that deadweight and speed are not issues for cutter suction dredgers, and that the impact on the dredging cycle had not been taken into account."

IMO agreed, he continued, and both EuDA and ICS are helping reframe the measures. "I'm quite convinced a market-based approach will be used in the future," Van de Ketterij concluded.

It was down to Envisan's Bart Callaert to wrap up the session with a look at turbidity measurements

under strict environmental conditions, using as a case study a project at the Port of Marina di Carrara, on the Ligurian coast of Italy. Only 25,000m³ needed removing, but the port's a site of national interest and tough conditions were imposed, including use of an environmental dredging bucket, stringent monitoring and sampling.

"There were six phases in the project: before, during, when no dredging was possible because of the weather, start dredging, stop for holidays, then start again," Bart recounted. "On top of that we had fishing boats coming in and out every day and turbidity generated from tugs bringing in big ships." Clearly quite a challenge!

SECOND SESSION

Jos Claessens from Belgium's Flemish community ministry, took the chair for *Dredging Tools and Extreme Conditions*, introducing Steen Lykke, of Femern Bælt (FB), whose presentation focused on the challenges of building the new, 20km-long fixed link (see *DPCs passim*).

And those challenges include: "Natura 2000 sites, gas pockets, cables, boulders, wrecks and bombs – plus mega sand ripples on the Danish side up to 4m high that could also be moving," he said, describing the dredging conditions that will apply if a tunnel is chosen over a bridge (which is yet to be decided).

"We'll have to dredge deeper than 45m and soils include extremely hard clay," Steen added. "Oh, you'll also have

to beneficially reuse the 20M m³ of material dredged."

Work's expected to get under way in 2012, he concluded, for completion in 2018 – "and you'll also have to cope with the 60,000 ships and 20,000 ferries using the waterway."

Challenges, although perhaps not quite on such an exceptional scale, were also the subject of MTI Holland's Jop Paauw's review of a lifecycle cost approach to dredger maintenance.

"It's a work in progress with DEME's cutter *d'Artagnan*," he said, describing the benefits of condition-based maintenance. "The focus is on pipes – especially bends – valves, pumps and cutterheads." Information gathered is used for wear modelling in differing soils. "We still have to model rock, but it all results in a reduction of Euros per cubic metre," he concluded.

Cutters of a different kind were the subject of Boskalis's Roeland Neelissen's presentation: developing the ripper draghead used on the TSHD *Queen of the Netherlands* to dredge rock during the Melbourne campaign (see recent issues of *DPC*).

"With trailers getting bigger and more powerful, we asked ourselves what force was available, and from that we looked at what force was needed," he said, detailing the studies that went into producing the trial ripper draghead. Test results and laboratory modelling led to greater suction power and other modifications aboard the *Queen*.

"Damage [to the draghead, pipes and pumps] was acceptable; most of the time we could repair it on board," he concluded. "And the project was a success, thanks to the co-operation between the many people involved."

Co-operation was also a major facet in IHC Merwede's Laurens de Jonge's look at the challenges of deepsea phosphorite mining. "How deep? Perhaps 3,000m, and the question asked is whether the dredging industry is a partner for the offshore mining industry. The answer is yes!"

Challenges included the energy needed at great depths, the dangers of gas explosions and seabed conditions, he continued, stating that the essential point was to adapt to varying sites. "All the time we're trying to get new systems to work," he said, "and this is where you need co-operation and



Banana and Boomerang islands take shape at Maasvlakte 2 in October



Yes! – François Mathijssen



Wear-resistant – Klaas Wijma



New design – Hasan Bugdayci



Not perfect – Jelmer Braaksma



Less grey hair – Daan Rijks



Natural resources – Jan Brooke

different technologies from different industries. Dredging can bring cutting and slurry transport to the table.”

CEDA Environment Commission (CEC) chairman **Polite Laboyrie** closed the session with an update on CEC's activities and challenges, including:

◆ *The London Convention* – “Present guidelines for handling dredged material are 10 years old”

◆ *OSPAR* – “Underwater noise is an up-and-coming subject”

◆ *EC Legislation* – “We also give general input to the EC as well as guides and guidelines.”

Mentioning Nick Bray's recent update of *Environmental Aspects of Dredging*, Polite said other soon-to-be-published guides would cover dredged material as a resource and dredged material management. The Environment Commission was also working on a series of guides for climate change, turbidity and the effects of underwater noise, he added.

He concluded with CEC's motto and *raison d'être*: “We pass on knowledge that thinks of dredging as a tool for sustainable development – and we try to make your job easier.”

CEO FORUM

The entire third, and final, session of the day was given over to a completely new Dredging Days concept in which four senior executives, moderated by Prof van Rhee, gave their views of the state of the industry in the current economic crisis.

Van Oord's **Koos van Oord** and Femern Bælt's MD **Peter Lundhus** were in place, but there were a couple of changes to the programme: EC TREN G2 chief Dimitrios Theologitis was caught up in a Belgian railway strike and replaced by EuDA secretary general Paris Sansoglou, while IHC Beaver Dredgers' managing director Bert Kips stood in for IHC Merwede chief executive Govert Hamers. It was Bert who took the floor first, opening by describing the drivers for shipbuilders... and the challenges faced.

“In the worst case we would have to close yards – not something you do without thinking of the future,” he commented, discussing a possible deepening recession. But he was optimistic enough to outline a raft of opportunities, including product innovations, developments in co-

operation with customers such as lifecycle support, new applications such as deepsea mining outlined earlier by Laurens de Jonge and new markets opening in parts of the world that have been less affected by the downturn.

Closing, his advice was “to make sure you invest in research and development, which will help you through a crisis and also make sure you're doing your best.”

Peter Lundhus was “in the happy position of being able to spend €4.8Bn over the next 10 years on the Femern project,” but as he detailed, the environmental obstacles leading up to the scheduled start of construction in 2012 were considerable.

“Innovation, innovation and innovation are what we need to overcome the obstacles and not least the time constraints,” he continued. “As project owners, we know what we want – we want to control it and spend the money effectively.”

Effectiveness and efficiency were **Koos van Oord's** watchwords: “The name of the game is managing your orderbook and your fleet. And I hope you won't fall into the trap of the 1980s in not attracting young people!

CEDA's AGM

“It's my first time as president to give this report,” said Anders Jensen, “and it's an honour and a pleasure”

Highlights for 2009 included the new strategy, dubbed *The Way Ahead*, which “reflects the changing world and the changing needs of members,” Anders continued, “and especially the events leading up to Dredging Days.”

They included the Environment Commission joint meeting with WEDA hosted by the Panama Canal Authority in Panama (see *DPC* May 2009) and especially CEDA's first foray into Russia (*DPC* Dec 2009) – “Both attended by around 100 delegates. We seem to have

Three presidents (l-r): current CEDA president Anders Jensen, Dutch section president and new CEDA director Johan Pennekamp and immediate past president Rewert Wurpts





Disposal – Stefan Multifunctional – Pilot project – Aarninkhof **Gert de Vries** **Ronald Koomans**

“I’m not pessimistic,” Koos continued, “but in the short term there won’t be the growth of the immediate past; let’s get used to that. As to the future, innovation in equipment, in processes and development of new markets is vital. In short, tighten your belt, get your act together and grab the opportunities!”

Paris Sansoglou wound up with EuDA’s take on the current European Union ports policy and action plan: “The overall objective is to repair an injury caused by opening the borders,” he stated. “When a truck goes across a border, there’s no issue; when a ship goes from one country to another, there’s lots of paperwork.”

The aim is to have an electronic maritime policy in place this year. “Basically, they’re looking for transparency and clarity,” Paris said.

Prof van Rhee led a lively question and answer session, commenting: “What I like especially is the accent on getting young people into the industry – but then you could say I’m biased!”

Which just left us with CEDA’s annual general meeting (see panel below), followed by a very pleasant reception,

hosted by the Netherlands Section, to conclude a long, but productive and always interesting day.

SESSION FOUR

Jan De Nul’s **Bernard Malherbe** took the chair for the *Academic Session*, which was extended from the previous *Academic Hour* thanks to popular demand. And it reflected the enthusiasm and innovation that young professionals are bringing to the industry.

Frederik Vinke, for example, carried out experimental research at Delft Technical University (TUD) into surrounding water jets with a thin film of air “with the aim of reducing friction forces and making a jet more effective at long distances”.

It’s complex work, matching pressures with air volumes to find optimum values that will increase dredging efficiency in the future.

Joost Mol’s study of flocculants enclosing silt particles in pore volumes took on board the lack of regulations. “I didn’t find any, but there *are* environmentally friendly flocculants and it *is* possible to enclose silt in pore volumes, so there are good

breached the barrier in the Baltic,” Anders added, referring to the conferences in Varna (DPC Dec 2007) and in Tallinn (DPC Jan 2009).

The revamped CEDA website – “where you can access all the presentations” – was also on Anders’ list, while coming up is participation in the EU Marine Strategy Framework Directive co-ordination group and its working group, Marine ST, “which will probably have more impact on the dredging and maritime industries than most people would like to think about!” Following the successful visit to Øresund, Denmark, Anders wants to see more such trips – and the Gijón port expansion project’s the next likely candidate.

Finally, thanking the secretariat as well as immediate past president Rewert Wurpts, Anders reminded the assembled members that 2010 is a WODCON year. “We’ve had a good number of papers submitted from our area,” Anders commented.

It was a neat introduction for Technical Papers Committee chairman, and CEDA

secretary-treasurer, Professor Cees van Rhee, who reported individual membership slightly up at 568 against 555 in 2008, “though we have exactly the same number of corporate members, 126, as last year.” As to finances, CEDA is healthy and plans to be “cost-neutral” in 2010, Cees stated.

Following a formal sign-off by the Audit Committee, that just left the election of the association’s new directors:

- ◆ **Andrew Birchenough** of Cefas, UK
- ◆ **Claudia Flecken** from Hamburg Port Authority, Germany
- ◆ **Tarik Jakhoukh** from Drapor, Morocco
- ◆ **Johan Pennekamp** of Deltares, Netherlands
- ◆ **Jan Vandenbroeck** of SDI, France
- ◆ **Bart Verboomen** from Belgium’s Baggerwerken Decloedt & Zoon, and
- ◆ **Loek Verheijen** of IHC Dredgers, Netherlands.

And with Anders’ best wishes to them all, the AGM closed and it was off to the evening reception hosted by CEDA’s Dutch section.

Quotes

“At a time of environmental concerns and energy conservation, it makes no sense to have old ships moored in the world’s anchorages quietly rusting away” – **Peter Hinchliffe** on regulations affecting ship recycling

“You can’t extend old lagoons and you can’t get permission for new lagoons – what can you do?” – **Stany Pensaert**’s dilemma for industrial waste material storage

“It’s a major source for science, but for us it was just a baseline study” – **Professor Tiedo Vellinga** caught 60,000 juvenile fish to see if they were being affected by sediment at Maasvlakte 2 (they weren’t)

“It’s not fair!” – **Dr Robert van de Ketterij**’s description of the IMO’s proposed CO₂ reduction goals and the impact on dredgers

“As you know, it’s always a problem for a Belgian to come to Holland” – **Bart Callaert** for once had a good excuse: a train strike and resultant congested roads

“If there are any contractors here, listen carefully! – **Steen Lykke** taking the immediate post-lunch slot and attempting to prevent the usual snoozes by announcing a possible 20M m³ of dredging contracts within two years

“A lot of teeth are used in the dredging industry” – **Jop Paauw** outlining the importance of cutterhead design

“Here you can see the draghead with the ripper teeth. Well, actually you can’t see them and I did that on purpose!” – **Roeland Neelissen** protecting Boskalis’s commercial secrets

“Of course, you can’t dredge at 3km with a hopper dredger!” – **Laurens de Jonge** facing challenges in deepsea mining

“Don’t forget you’ll also need orders!” – **Bert Kips**’ advice if you want to stay in business

“We’re up against Danish legislation, German legislation and EU legislation – and they’re not compatible!” – **Peter Lundhus** describing environmental aspects of building the Femern Bælt fixed link

“This is definitely *not* a dying business” **Koos van Oord**’s take on dredging industry prospects

“I’m not a politician!” – **Paris Sansoglou** standing in for an EC official

“It was rather fluffy” – **Joost Mol** describing silt when too much flocculant was added

“We can do some tricks, but in the end the operator will work the way he wants to” – **Klaas Wijma**’s parameters for cutterhead design reliability



New to Dredging Days, the CEO Forum produced lively debates

opportunities. I used 5mg of flocculant to capture 1kg of silt, though it depends on turbulence and the type of silt.”

PhD student **Rik Bisschop**'s research into hindered erosion of granular sediments compared studies by Van Rijn and by Prof van Rhee – and found the latter's 2007 concept “predicts erosion rates very well.”

His work spanned the use of very high velocities, the breaching of dykes and jetting with a TSHD. It also took in shear stress, single particle erosion,

multi-layered erosion and failure of soil mass. And his summary, based on Dutch football manager Johan Cruyff's philosophy, was: “Sneller als ze loskomen, kennen ze niet eroderen.” I leave the translation of that to you!

Fellow PhD student **François Mathijssen** concluded the session with a look at the behaviour and modelling of organic soils. “For design-and-construct projects, it's not enough to say ‘Oh yes, that's peat’: we need to do better.”

Detailing the tests used in the past

and using new Dutch field investigation data, he showed how temperatures could affect results. “A key issue is to test what the fibres do,” he stated. And he built a test rig to do just that, validating results at Dutch test sites.

SESSION FIVE

CEDA Africa Section's **El Houssaine el Kanit** was in the chair for *Dredging Tools and Energy Scarcity/Operational Efficiency*, which began with VOSTA LMG's **Klaas Wijma** bringing us up to

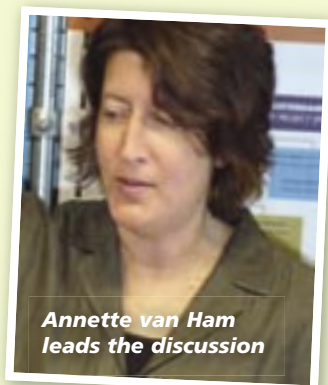
A Technical Visit To Beat Them All!

Europe's biggest dredging, reclamation and port construction project, Rotterdam's €2.9bn Maasvlakte 2, was the fitting venue for Dredging Days' 2009 technical visit

As DPC reported in a previous issue, the Port of Rotterdam has opened *Futureland*, a dedicated visitor centre that overlooks the Maasvlakte 2 (MV2) construction site, which has already attracted 50,000 people since its opening in May 2009.

The centre's **Annette van Ham**, joined by MV2 dredging and environmental monitoring executive **Wil Borst** and **Mark Moens** from PUMA – the Boskalis-Van Oord consortium building the new port – took us through progress to date and the future schedule.

As regular readers know, DPC published two articles on MV2 (in the Sept and Oct 2009 issues) covering both the design concept and the actual work. And it was astonishing to see the progress made in a couple of months: 77M m³ of sand had been dredged and placed, representing about 25% of the phase one total.



Annette van Ham leads the discussion

LANDMARKS

Annette told us a huge milestone was reached in the first week of November when connection was made between the first offshore island – known as *Banana* because of its shape – and the mainland to create a 4km peninsula that will serve as MV2's ‘soft’ sea defence. November also saw another milestone: finalisation of a design optimisation process for the ‘hard’ seawall defence on MV2's northern perimeter, along the Maasgeul that gives access to the Port of Rotterdam. And as you read this, connection between the new peninsula and the 3km second island, called *Boomerang*, will probably also have been made.

That's especially significant because *Boomerang* will be home to the Rotterdam World Gateway (RWG) container terminal: PUMA's civil works subcontractor BAVO-MV2 is already busy building an access road to the site and construction of the quay wall's scheduled to start next month. RWG should be operational by 2013 – and the first ship's already booked its slot for that year.

Annette was keen to draw attention to the

compensation measures taken to offset the project's impact, including building new dunes at Delfland and the creation of a special seabed protection area in front of MV2. But there's also the *Rotterdam Main Development Project*, which is aimed at making South Holland a better place to live.

“Projects include a river park, 7.5km of new beaches, bicycle tunnels under highways and many more,” she said. “It's a dual objective – not just nature compensation, but liveability.”

SITUATION TODAY

On average, seven trailer suction hopper dredgers were operating around the clock during our visit – an impressive sight. And, as Wil Borst told us, an extensive monitoring programme costing €10M is in place to keep an eye on potential or actual impacts on the North Sea ecosystem; it's within predicted margins so far, he said.

“Before work started, we spent €20M on the environmental report – it runs to 6,300 pages, is contained in specially designed chests, is the biggest ever produced in the Netherlands and took Royal Haskoning 18 months to write it,” Wil stated.

Today, around 300 seabed locations are charted and observed, while silt concentrations are also measured and compared against satellite photographs taken of the North Sea at

date with work on *Duracore* cutterhead teeth, a project in partnership with metal specialist Sandvik.

"The aim is to increase tooth lifetime by two to three times, which is considered very high, as well as reliability in all forms of rock and a reduced cost per cubic metre," he said, outlining the parameters – from tooth shape through operating conditions, soil variations and more – that had influenced the work. The idea was to put a very hard, but flexible, core into cutter teeth.

"Tests, more tests and even more tests followed," Klaas continued, praising the expertise of partner Sandvik. "There are about 5,000 grades of hard materials and the metals Sandvik selected worked like hell!" Casting, however, was a challenge in itself: "It looks very simple, but it was the first time in history that it worked."

The result after field trials? "One of the outcomes we didn't expect was that teeth are self-sharpening, which is very promising," he explained. "Efficiency of the dredger – because we didn't have to change teeth so often – was up by 20%. And since CSDs can cost up to €20,000 a day, that's a huge saving."

The teeth are commercially available, although Klaas is continuing to work on improving them – "There's still a lot

of potential..." he concluded.

Future dredging tools from new materials was theme of IHC's innovation and development manager **Hasan Bugdayci's** presentation, and he concentrated on the use of composites, citing the *Lighthouse* dredge pump (*DPC's passim*) as an example.

"We began the study to see if it was possible to make the outer casing out of composites," he said, listing their advantages – which range from fatigue, fire and chemical resistance to thermal and electrical insulation. The finished product cut weight from 60 to 22 tons and, more importantly, cut change time from four days to one day. But it has yet to sell well...

Hasan's latest design is the *TeleTube* – "a plug-and-play extendable suction tube for TSHDs that adds 67% to the length and is carried in a composite carriage". And that's being tested aboard Jan De Nul's trailer *Gerardus Mercator*. "We estimate breakeven point is about 18 months," he concluded.

Which brought us to **Jelmer Braaksma's** presentation entitled *Estimating the Immeasurable: Soil Properties*, which won the IADC Best Paper Award (see panel on page 34 for a full description).

The new chairman of newly named *Young CEDA*, Daan Rijks, wrapped up

the session with an update and mission statement from the young professionals who are, as he put it, "dedicated to creating a platform to express and present themselves whilst allowing for the opportunity to interact with older or more experienced colleagues". He concluded: "We'll function as a challenger and critical observer of the board and its decisions and, where possible, Young CEDA will offer new ideas and be available for input and feedback on organisation."

Those are tough challenges, but as he listed 2010 and 2011 objectives, Daan pointed out that two former Young CEDA members are now on the association's board. Initiatives continue apace meanwhile, not least online, with the CEDA Wiki and discussion forum very much to the fore – and both excursions and seminars are planned.

SESSION SIX

Arno Talmon, of Deltares, took the chair for the concluding session, *Dredging Tools and Dynamics of Nature*, introducing **Jan Brooke**, who spoke on behalf of the UK PIANC Environmental Commission on progress with *Working with Nature*.

"It's quite a broad concept with the aim of identifying win-win solutions, she stated, "but it will take some time

the same moment, so that the silt content can be determined in the future (also using satellite images). "After all, over the total project we'll be placing 8M to 12M tonnes of material into the water," Wil pointed out.

His work also involves using a survey vessel up close to the TSHDs to measure dredger-induced plumes, checking on the health of juvenile fish and making sound measurements of dredgers' underwater noise. "Results of the latter still have to be analysed, but we expect conclusions next year."

As a side effect, dredging is also of interest to palaeontologists. "The biggest mammoth bone has just been found," Wil continued, "and it was quite intact too. We believe there are many more to be uncovered."



FINALLY...

Apart from the commencement of both Rotterdam World Gateway's quay wall construction and the hard sea defences, major milestones for 2010 include €500M-worth of 'interface' projects that will ensure MV2 links seamlessly to existing port infrastructure. With other measures, that includes a viaduct for road and railway near the Slufter (a deposit site for contaminated material).

Perhaps the most spectacular sight will be the arrival of 7M tonnes of hydraulic engineering stone – 5M tonnes of it from European quarries – for the hard sea defences. They'll look very un-Dutch, for instead of a solid covering, they'll have a 4–5m-thick layer of boulders laid loosely on top of each other, while a few dozen metres in front blocks removed from the existing barrier will be laid in the sea to cushion the initial impact of any super-storm.

"We have to design for a one-in-10,000-year storm," Mark told us, "and that means a wave height of slightly less than 9m." The design's not only cheaper, but a better ecological solution: environmentalists expect an attractive biotope to emerge between the sea defence body and the blocks.

The work will also see the enormous E-Crane (see *DPC* Sept 2009) swing into action with its lifting capacity of 50 tonnes and reach of 63m. To quote the governor of California, *DPC* will be back!

More info at www.portofrotterdam.com

Mark Moens (l) and Wil Borst

IADC

Best Paper Award

"We have to invest in continuous innovation – and a very novel and innovative approach that potentially has great impact on productivity in the dredging sector was presented this morning"

That was **International Association of Dredging Companies (IADC)** secretary general Constantijn Dolmans' introduction to *Estimating the Immeasurable: Soil Properties*, a paper presented by IHC Systems' **Jelmer Braaksma**.

Worth €1,000, plus a certificate and publication in IADC's magazine *Terra et Aqua*, the award recognised a work in progress that's already bearing fruit.

As Jelmer explained, the research is aimed at producing model-based adaptive controls to estimate overflow for hopper dredgers; their trail force; a grain size estimator "that we've successfully used aboard several cutter suction dredgers"; and an anchor position estimator "that lets the dredgemaster know when to reposition the anchors, detects anchor drag and can further improve automation aboard a CSD."

Planned developments include estimating the pressure drop over a draghead along with jet penetration depth; estimating pump wear and predicting the moment for impeller change; estimating grain size based on pump behaviour; and estimating settling velocities in the hopper along with the sand bed height.

As Constantijn put it: "Such an approach enhances productivity – and, as we all know, increased productivity *will* result in economic growth."

More info at
www.iadc-dredging.com

Jelmer Braaksma (I) receives the Best Paper Award from Constantijn Dolmans

to achieve." She made the point that "aquatic ecosystems are vital to human economic well-being, but the current approach is not sustainable".

Using a UK Norfolk Broads case study – the Broads are sensitive, protected yet used extensively for recreation, and so need regular dredging – Jan highlighted some of the problems. "Legislation in the UK is not designed to encourage the reuse of dredged material, for example," she said. And she looked too at projects in the Humber Estuary and Le Havre's wetlands and bird island creation.

"Working with Nature is something we all should be doing – starting right now," she concluded.

Beneficial and safe disposal of dredged material was also a concern of Boskalis's **Dr Stefan Aarninkhof**, who used the development of Ras Laffan (DPCs *passim*) as his case study.

"It's a massive project and there's always some spill of fine material," he said. "We had to demonstrate we could work within the limit set – 30mg per litre." He explained how the project was modelled in advance and also how 'safe disposal maps' were generated that allowed skippers and dredgemasters to look up where and when they could safely place dredged material. This was, he concluded, "Vital in helping us achieve the project."

Vuyk Engineering's **Gert de Vries** turned to something completely different – a modular, dismountable water injection dredging (WID) system that would enable, say, a backhoe to become a multi-purpose dredger.

Vuyk's been working with DEME's multicat *Parakeet*. "WID is relatively cheap and becoming more popular," Gert asserted. "Vessels are mostly used in calm waters, but we're making progress in compensating for heave and roll on the WID head."



One of the best attended conferences

Medusa Explorations' **Ronald Koomans** was also making progress – in his case, on measuring the effects of dredging in relation to the dynamics of nature – and using home-grown software to do it.

"Our vision is to quantify the behaviour of fines in dredging and in natural dynamics and we had the chance to conduct a pilot project aboard a hopper dredger," he said, explaining the results for sand, clay and other materials. "The effect of dredging on the environment should be related to the impact of the dynamics of nature," he concluded.

And thus to the final presentation of the 2009 Dredging Days: a field survey of a dredging plume during gravel dredging, by IMDC's **Alexander Breugem**, who made "a model to show the difference in plume development along and against the current flow."

During field trials, he also had a survey vessel equipped to measure plume development with both ADCP and a silt profiler. "Dredging along the flow gives a wider plume that decays slower," he stated.

FINALLY...

Prof van Rhee concluded Dredging Days' formal business with a summary that thanked those who had made it happen, especially CEDA general manager **Anna Csiti**, the secretariat and the sponsors. He pronounced his delight at the enthusiastic reception delegates gave to the CEO Forum.

"Another new topic for CEDA and I've had a really positive response," he said. "I was very pleased by the optimistic outlook of the CEOs and look forward to hearing more."

And with that, it was off to another new development – farewell drinks and a last chance to tour the exhibition.

In all, a Dredging Days to remember – and if you couldn't make it, the full presentations are available on CD from CEDA, at...

www.dredging.org