



International B.V.

## DCN complete two major cooling water intake projects

In the last year, Dutch company DCN have completed two major cooling water intake repair and refurbishment projects. They have maintained their reputation for innovation, rapid mobilisation and completing works on schedule.

### China Light and Power, Black Point Power Station, Hong Kong SAR

The task was to clean and repair four seawater intake culverts and install new hypochlorite dosing lines. Each culvert is about 400 metres long, constructed from 2.4 metre square concrete sections. The culverts were thick with marine growth and the concrete sections had shifted, opening up gaps in the culvert walls. Extended diving operations were only possible from the shoreside ends.

The work had to be completed in two outages, the first in from 1<sup>st</sup> November to 31<sup>st</sup> December 2003, the second from 1<sup>st</sup> to 31<sup>st</sup> January 2004.

#### Cleaning machines and mobile habitats

DCN's solution was two custom built Remotely Operated Cleaning Machines (ROCMs). Each ROCM cleans marine growth from the culvert walls and floor, crushes it into a slurry and pumps the slurry back to surface through a discharge hose.

For the diving work, DCN supplied two custom built Self Controlled Habitats (SCHs). Each SCH is a diving bell on wheels, allowing the divers to drive along the culverts carrying out repairs and installing the new dosing lines.



*An ROCM with three computer controlled cleaning heads and a floor level grinder and crusher,*

#### Rapid Mobilisation

The contract was signed in July 2003. ROCM construction was sub-contracted to Seatools (Netherlands) and SCH construction to Oberman (Germany). These sophisticated machines were designed, built, tested and commissioned in just ten weeks.

Mobilisation in Hong Kong started in mid-October and work started on schedule on 1<sup>st</sup> November.



*An SCH. The black drive wheels operate against the culvert walls.*

#### Completion ahead of schedule

There were two ROCM crews and four teams of divers, working 24 hours per day with two diving teams on each shift working in separate culverts. Operations were run from a state-of-the-art diving and habitat control room, with a decompression chamber on standby in case of any incidents. In over 7000 man hours of diving, however, there were no accidents or decompression problems.

Although the start of the second outage was delayed for several days, at the client's request, work was completed ahead of schedule on 29<sup>th</sup> January 2004

### Dubai Aluminium Company, Jebel Ali Plant, Dubai, UAE

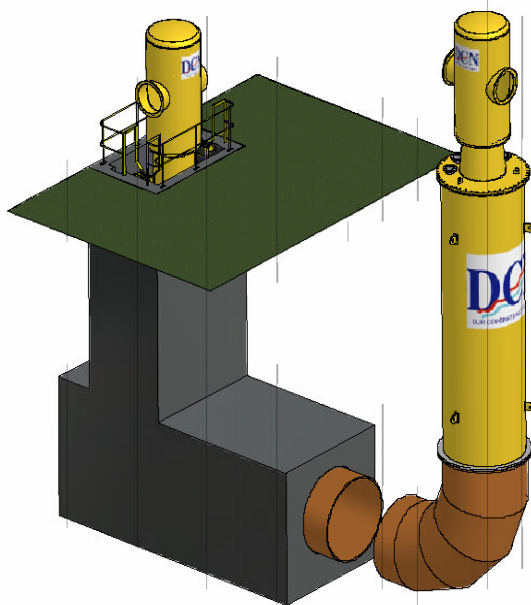
The refurbishment of three steel seawater intake pipelines. required the removal of marine growth and old corrosion coating, the removal of old dosing line, anodes and anode brackets, re-coating and the replacement of anode brackets and anodes. The intake heads are to be replaced with new vortex breakers. Each pipeline is about 400 metres long and 2 metres in diameter.

#### Plugs and risers

DCN fitted risers to each end of the pipeline, using a unique plug system at the shoreside end. This allowed the pipeline to be de-watered with all subsequent work carried out in the dry.

After inspection dives in February 2004 to verify that the pipe wall was thick enough to sustain the pressure difference, mobilisation started in the last week of March. Work started on the 29<sup>th</sup> March and the first pipe was de-watered about four weeks later.

*Continues*



*The concept. Pressure locks were fitted in case over-pressure work was required*

### Working in the dry

The de-watered pipeline was ventilated at a rate of 5000 m<sup>3</sup> per hour, allowing round the clock working by teams of fifteen men.



*Removing marine growth and the old dosing line and anodes*

After the removal of the marine growth, old dosing line and anodes, the surface was grit blasted to bare metal SA2.5. New anode brackets were installed using a stud welding gun. The surface was then coated with Humidur anti-corrosion coating and the new anodes were fitted.

### On track for early completion

After checking the coating thickness and a final inspection walk through, the pipeline was flooded and showed a striking increase in flow rate.

Work on the second pipeline started immediately and was completed in mid-July. The project is on track to finish ahead of schedule in the second week in August 2004.



### Company profile

DCN International is a Dutch company with offices throughout Europe and in Hong Kong.

We have over 40 years experience in all types of underwater operations in Europe, Africa, the Middle East and Far East. We are specialists in:

- ✦ All diving operations, including saturation diving
- ✦ Hyperbaric operations
- ✦ Underwater concreting
- ✦ Underwater excavation
- ✦ Concrete pumping
- ✦ Inspection and survey
- ✦ Soil anchorage
- ✦ Injection works (above and below water)

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