## SUEZ's Water Technologies & Solutions

## for the Upstream Oil & Gas industry

ready for the resource revolution



### full-service provider delivering across the value chain

#### technologies \_\_\_\_\_ solutions & services \_\_\_\_

#### delivery models



Equipment and systems



Water quality monitoring





Data intelligence for asset performance

Lifecycle

services







Water services (BOO, O&M, mobile water)





#### End User: PDO Musallim

Project: ILS Replacement

Delivery 2016

**Plant Details:** 

Combination of Deoiler & Desander Hydrocyclones

Capacity: 126,000BWPD

OInlet Oil: 500ppmv

OInlet TSS: 242mg/l

- Outlet Oil: 30ppmv norm / 50ppmv max
- Outlet TSS: 10mg/l max
- O Sand Handling package included





#### End User: PDO Musallim

Project: Q0113-00

Delivery 2015

**Plant Details:** 

Combination of Deoiler & Desander Hydrocyclones

Capacity: 132,000BWPD

OInlet Oil: 500ppmv

OInlet TSS: 242mg/l

- Outlet Oil: 30ppmv norm / 50ppmv max
- Outlet TSS: 10mg/l max
- O Sand Handling package included





#### End User: PDO Musallim

Project: Full Facilities Ph I & II

**Delivery** 2007 & 2008

#### **Plant Details:**

Combination of Deoiler & Desander Hydrocyclones

O Capacity: 125,800 BPD

OInlet Oil: 500ppmv

OInlet TSS: 242mg/l

- Outlet Oil: 30ppmv norm / 50ppmv max
- Outlet TSS: 10mg/l max
- O Sand Handling package included





#### **End User: Occidental of Oman**

Project:MukhaiznaDelivery2008

2x IGF trains – each 189,000 BWPD

Inlet Oil Content:
 Outlet Oil Content:

200 ppmv < 20 ppmv



Project: Wadi Latham Delivery 2006

O Desander & Deoiler Hydrocyclone + IGF - 50,000 BWPD

Inlet Oil Content:
 Inlet Solid Content:
 Outlet Oil Content:

5,000 ppm 1,000 ppm < 50 ppm



#### **End User: Daleel Petroleum**

ProjectArabian FieldDelivery2016

• 2 x IGF, NSF trains – each 50,000BWPD

Outlet Oil Content: Outlet Solids Content: 40 ppm(v) <1.6 mg/L TSS





#### **End User**

Project Qarn Alam

Delivery 2010

#### **Plant Details:**

- 2 x Corrugated Plate Interceptor Tanks
  4 x Induced Gas Flotation Vessels
  Capacity: 480,230 BWPD
  Inlet Oil Concentration: 4,000 ppm
  Outlet Oil Concentration: < 20 ppm</li>
- O Inlet Operating Pressure: 3 kPag





# SUEZ is ready to work by your side







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## **CPI Performance at PDO**



## Background

- Petroleum Development Oman (PDO) is the leading exploration and production company in the Sultanate of Oman
- PDO deliver the majority of the country's crude oil production and natural gas supply, but above all we focus on delivering excellence, growth and sustainable value creation within and well beyond our industry
- PDO produce 70% of the country's crude oil production and nearly all of its natural gas supply
- Production of produced water is increasing along with oil production
  - Current ratio is 9 bbl Produced Water (PW) / bbl Oil
  - Oil API varies from light to heavy
- PDO has different configurations of PW treatments to meet specifications for WI/DWD/other re-uses
- One of the PW configuration is CPI+IGF installed at QASP; where Oil Viscosity is API 16



## **CPI Requirement in PDO**

PDO has considered CPIs for primary treatment at few location (e.g. Qarn Alam, Nimr )

Key Features of CPI in QASP:

- Heavy oil removal from produced water
- Coalescing pack to enhance oil separation
- Better separation and remove oil droplets above 75 microns
- ► Low pressure application
- ► Gravity flow, thus avoid additional pumping which can cause shearing of oil droplets
- Avoid requirement for surge tank at upstream
- Low maintenance



## **CPIs at Qarn Alam**



## **CPIs Performance at QASP**





Consistently meeting design envelope with immense fluctuations of inlet OIW

- CPI performance is being monitored since CPI its operating phase (year 2012)
- · No performance deterioration even at OIW peaks at CPI inlet
- Superior OIW separation efficiency even at current low operating fluid temperature
- · Low inflow also a contributor for improved performance



PDO has seen a satisfactory performance record in meeting Oil in Water (OIW) at CPI outlet within the design envelope

## Thank You

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