Jeddah water & wastewater management contract

CMI Workshop - Dealing with water scarcity through PPPs for desalination and non-revenue water reduction

13th December 2016

Fabien Mainguy, Development Manager, Africa Near-East
Fabien.mainguy@suez.com

ready for the resource revolution
Agenda

1. Introduction on SUEZ

2. Jeddah water management contract
Introduction on SUEZ
An industrial services and solutions company
Specializing in securing and recovering resources

- We provide expert **water optimization** services in water networks, engineering, equipment, operation and maintenance. We pioneer advanced solutions through waste water recycling and seawater desalination.
- We ensure waste collection and disposal and promote **waste recovery** to generate renewable waste based energy and secondary raw materials.
- We offer innovative solutions in consulting for the sustainable **urban development**.
Key international positions

82,000 employees in +70 countries

€15,1 billion in revenue in 2015
Equal share waste / water

31% of revenue made internationally (outside Europe)

97 million people supplied with drinking water

66 million people benefiting from sanitation services

10 million people supplied with desalinated drinking water

14 million tonnes of waste recovered

44 million tonnes of waste treated
Business presence in KSA

- Water & WW Services contract
- Construction (water plant built/under-construction by SUEZ)
- Industrial water plant construction (plant built/under-construction by SUEZ)
- Consulting

SUEZ in KSA since 1950
Jeddah Water Management Contract

1. Context of the contract

2. PBC design and main activities

3. Remarkable results

4. Lessons learnt – toward a sustainable service improvement
Context of the contract
National water strategy

Creation of the National Water Company (NWC) in 2008 in a context of:

- Insufficient and poorly-maintained infrastructure (>40% water losses, 2/3 population not connected to sewers).
- Poor quality of services, weak organization and public discontentment.
- Lack of natural resources and high water production cost.
- Growing population and economic development generating substantial demand for water and wastewater services.
National water strategy

NWC PPP Roadmap
Reforming the Saudi Water Sector Strategic Transformation Plan

Identify Opportunities for Improvement
- Operational Audits
- Diagnostics
- Benchmarking
- Action plan

Management Contracts (6-7 years transition)
- Establish NWC
- Sign 6-7 years Performance Based management Contracts
- Boost sector performance
- Make water sector attractive

LT partnerships PPP
- Early PPP success paving the way for complex contract
- Move to LT PPP
Jeddah context - water supply

Jeddah is 99% dependent on desalinated water for its water supply

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Daily Water Supply (Mil m3/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>0.63</td>
</tr>
<tr>
<td>2009</td>
<td>0.75</td>
</tr>
<tr>
<td>2010</td>
<td>0.88</td>
</tr>
<tr>
<td>2011</td>
<td>0.98</td>
</tr>
<tr>
<td>2012</td>
<td>1.01</td>
</tr>
<tr>
<td>2013</td>
<td>1.08</td>
</tr>
<tr>
<td>2014</td>
<td>1.13</td>
</tr>
<tr>
<td>2015</td>
<td>1.09</td>
</tr>
</tbody>
</table>
Jeddah Water Services – shareholding structure
Jeddah Water Services - presentation

Client: NWC

Type of Contract: Management Contract
- Scope: Water Distribution, Wastewater Collection & Treatment and Storm-water retention dams for the entire city of Jeddah (5 million inhabitants)
- Initial duration 7 years (September 2008 – August 2015).
- Extended in December 2014 for 22 months until June 2017.

Capacity
- 1.1 Million m³/day drinking water delivered through 200,000 house connections.
- 7,000 km distribution network and 40,000 valves.
- 70,000 Wastewater House connections.
- 600,000 m³/day treated through 7 WWTP.
- Big pumping station facilities (1.2 Million m³/day).
- 23 Million m³ Storm-water storage capacity with 5 dams.
- 2 Million m³ of Strategic Storage for Drinking Water (+ 2 Million m³ under construction).
- Training center delivering more than 4,300 training days every year.

Staff
- JWS: 17 employees.
- Jeddah City Business Unit (JCBU) – NWC: 1,500 Employees + 1,500 Sub-Contractors’ Employees
PBC design and main activities
PBC design

- Management Fees + Performance related measured through the achievement of:
  - 22 KPIs covering the whole scope of the contract (only 7 with incentives but all with penalization if below targets….)
  - Services Delivery Plans
  - Enabling Projects

- Rapid establishment of trustable relation with the client => increase on the scope of the contract by > 40% in value (wastewater activities, regional services; etc…)

<table>
<thead>
<tr>
<th>KPI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Revenue Metering Coverage</td>
</tr>
<tr>
<td>1.2</td>
<td>Collection Ratio</td>
</tr>
<tr>
<td>1.3</td>
<td>Collection Period</td>
</tr>
<tr>
<td>1.4</td>
<td>Metered Water Usage</td>
</tr>
<tr>
<td>1.5</td>
<td>Volume of metered water sold</td>
</tr>
<tr>
<td>2.1</td>
<td>Service Continuity</td>
</tr>
<tr>
<td>2.2</td>
<td>Water Quality (sampling)</td>
</tr>
<tr>
<td>2.3</td>
<td>Water Quality (testing)</td>
</tr>
<tr>
<td>2.4</td>
<td>Leak Run Time</td>
</tr>
<tr>
<td>2.5</td>
<td>Sewer Flooding Incidents</td>
</tr>
<tr>
<td>2.7</td>
<td>Customer Services (complaint &amp; billing queries)</td>
</tr>
<tr>
<td>2.8</td>
<td>New Connection Time - Water</td>
</tr>
<tr>
<td>2.9</td>
<td>New Connection Time - Waste Water</td>
</tr>
<tr>
<td>2.11A</td>
<td>Tankered Water Service - Walk in</td>
</tr>
<tr>
<td>2.11B</td>
<td>Tankered Water Service - Post Paid</td>
</tr>
<tr>
<td>2.16</td>
<td>Customer Services (telephone responses)</td>
</tr>
<tr>
<td>2.18</td>
<td>Customer Satisfaction</td>
</tr>
<tr>
<td>3.1</td>
<td>Self Sufficiency</td>
</tr>
<tr>
<td>4.1</td>
<td>Power Consumption</td>
</tr>
<tr>
<td>8.1</td>
<td>Waste Water Treatment Efficiency</td>
</tr>
<tr>
<td>8.2</td>
<td>Sewerage Network Preventive Cleaning</td>
</tr>
<tr>
<td>8.3</td>
<td>Availability of Wastewater pumps</td>
</tr>
</tbody>
</table>
Operation control center (OCC)

- OCC Uses SCADA (supervisory control & data acquisition) to monitor and manage water supply system.
- Uses over 600 data points to monitor stations and network.
- 24/7 operations.
Advanced network management

**Creation and Implementation of Distribution Zones (DZ)**

- To operate the network through an advanced system with pressure control and flow measurement linked to the SCADA.
- To manage the evolution from rationing to continuous supply (coupled with H24 programs).
- 45 zones to be operational by the end of 2016 out of 55 zones in total.
- 2 zones implemented with Aquadvanced real time network monitoring.
Leak detection and repair program

- **Leak detection & repair**
  - Implementation of process and methodology; training and follow-up.
  - Detection process: SUEZ Helium technology and Acoustic Correlation (invisible leaks).
  - 44 teams to repair all leaks in Jeddah working 24hrs/7 days.
  - Leak run time (average time to repair the leaks): from 59 hours in 2008 to 24 hours maximum in 2015.

- **Leakage detection and repair has been less performing since 2014 due to**
  - Expiring contracts with delayed renewal.
  - Budget Cut.
  - Equipment renewal momentum (6 months).
### Water network extension

#### Water Services Coverage

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Network length</td>
<td>5,500</td>
<td>7,000</td>
<td>27%</td>
</tr>
<tr>
<td>House connections</td>
<td>154,720</td>
<td>192,000</td>
<td>24%</td>
</tr>
</tbody>
</table>

#### Expansion of Water services

- Network Coverage: 80%
- Coverage after current projects completed: 90%
Strategic reservoirs to provide water supply reliability

- Currently there are 8 Strategic Reservoirs with 2 Mm3 storage built over the last 3 years + service reservoirs

- Total capacity to be extended to 4 Mm3 (Faysaliah and Birman)

- Guinness Records for the biggest reservoir ever built
Knowledge transfer to NWC staff

The Training Plan is a key pillar in reform of the Saudi water sector:

- The establishment of the NWC implied the transfer of > 6,000 employees from the Ministry of Water and Electricity to NWC (of which 700 to JCBU in Jeddah).
- The training program was conceived as a key change Management tool.
- Contractual architecture with a “Dedicated Training Fund” (DTF), managed by JWS, with a budget of 25 M SAR (approx. 5 M €).
- The construction and startup of the new Training Centre was the 1st contractual deliverable.
- 26,500 training days were delivered over 6 years representing an average of 3 training days per employee per year.
Remarkable results
Distribution zones implementation results

- Water Savings over 2,000 m\textsuperscript{3}/day in a pilot DZ $\Rightarrow$ 10% potential savings per DZ
  - Additional 20% savings were met in the zones equipped with Aquadvanced real-time monitoring (NRW final rate of 12%)

<table>
<thead>
<tr>
<th>No. House Con.</th>
<th>6,530</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of network</td>
<td>160 km</td>
</tr>
<tr>
<td>No. of leaks</td>
<td>73% reduction</td>
</tr>
<tr>
<td>Water Demand</td>
<td>11% reduction</td>
</tr>
<tr>
<td>Zone Pressure</td>
<td>1 – 1.7 bar reduction</td>
</tr>
</tbody>
</table>

![Graph showing flow and pressure monitoring before and after PRV installation.](image)
Progress in supply frequency

- Gap between supply periods per average customer has reached 8 days in 2016 from 23 days in 2009
  - With a water supply increased from 0.63 in 2009 to 1.09 Mm3/day in 2016 (x 1.73), and the reduction of NRW sources, the average frequency supply has been multiplied by 3.

  - % of Customers with Continuous Water Supply (24 X 7) : 18 %
  - % of Customers with Intermittent Water Supply : 82 %
Training of NWC staff
Lessons learnt - toward a sustainable service improvement
Outcomes of the Jeddah management contract

- **Significant improvements were made, without tariff increase**
  - Effective decision to reform the water and wastewater sector (National Water Company).
  - Focus on a small number of objectives: leakage reduction, tanker water reduction, rehabilitation of wastewater treatment capacity.
  - Selection of renowned operators (priority to “value for money”).
  - Training and knowledge transfer to NWC’s staff.

- **An environment which remains challenging**
  - Partial control over sub-contractors having a key operational role.
  - Institutional and political evolutions since 2015 with impacts to the water sector.
  - Revision of water prices in March 2016 led to protests and recovery of bills becoming difficult.

- **Tied with contractual KPIs, and financially incentivized, the private operator makes its best to overcome difficulties and put up with actual operational challenges.**
10 key factors of PBCs’ success
Lessons learnt from SUEZ’s experience

- A strong water and sanitation governance
  - Definition of clear objectives and KPIs.
  - Explicit distribution of roles between the public authority, the utility, the contractor.
  - Adequate devolution of responsibilities to empower each actor on its role and objectives.

- A smart PBC design
  - Focus on NRW indicator but integrated approach to tackle the multiple causes of NRW.
  - Provide with a reliable baseline or the possibility of a rebaselining.
  - Targets and indicators to be ambitious but SMART (specific, measurable, assignable, realistic, time-related).
  - Ensure mitigation of risk, with risk responsibility given to the actor who can best handle it.
  - Integrated management of CAPEX and OPEX, and flexibility on the management of CAPEX.

- A resilient economic model
  - Enhance financial sustainability with taxes, tariffs and transfers.
  - A sustainable territorial anchorage through knowledge transfer, access to water for all, involvement of stakeholders.
Thank you for your attention

fabien.mainguy@suez.com