Jamshedpur Utilities and Services Company Limited

Improving WSS Services through Private Sector Partnerships

Jamshedpur Utilities and Services Company Limited (JUSCO), a wholly owned subsidiary of Tata Steel, was set up in August 2003 to improve the quality of civic services in Jamshedpur. The intent has been to make it a model town with world class facilities. This initiative of converting a cost-centric service into a commercial customer-oriented company is the first of its kind in India.
The purpose of setting up a separate utility was to provide integrated world class utility services including water supply, power supply, waste management, and other allied civic services to the citizens.

Executive Summary

The city of Jamshedpur in India has seen impressive improvements in utility services through the establishment of a commercial and customer-oriented company, the Jamshedpur Utilities and Services Company Limited (JUSCO).

Municipal services were provided in Jamshedpur by Tata Steel’s Town Division Unit which operated as a cost-center for over 97 years. However, its operations were impacted by financial constraints, limited human resources and lack of exposure to modern technologies and processes that hampered the effective provision of essential services like water supply and waste management. The Town Division was under pressure to increase its scale of operations given the rapid population growth in the periphery of its service area. In order to address these issues Tata Steel signed a two-year technical partnership with Veolia Water, an international water company. The tie-up sought to provide management and technical consultancy to Tata Steel.

Tata Steel’s decision to corporatize the Town Division Unit enabled the expansion and improvement of services, greater efficiency, and financial viability. Thus was created JUSCO, a wholly owned subsidiary of Tata Steel, on August 25, 2003. JUSCO was carved out of the Town Division for improving the quality of civic services and for turning Jamshedpur into a model town with world class facilities. A partnership between Tata Steel and JUSCO was formalized through an agreement with clearly defined performance standards. Under its agreement with Tata Steel, Veolia Water continued to support JUSCO through 2005.

The technical tie-up with Veolia, along with JUSCO’s own improved performance, enabled it to implement various measures for advancing the management of its services. These resulted in impressive service improvements and efficiency gains for JUSCO. Today, it is the only private operator in India that provides comprehensive municipal services to about 500,000 people in Jamshedpur.

This Field Note seeks to capture the initiative of converting a cost-centric service into a commercial and customer-oriented company. Based on its successful home operations, the private operator is also exploring options for expanding its expertise beyond its own operating areas to other interested towns and cities, while continuously improving services in Jamshedpur.

Background

Jamshedpur is located in the East Singhbhum district of Jharkhand on the Chota Nagpur plateau and is surrounded by the Dalma Hills and the rivers Subarnarekha and Kharkhai. Home to the first private iron and steel company in India, Jamshedpur or the ‘Steel City’ spans an area of 64 square kilometers. The city, initially known as Sakchi, was later named Jamshedpur in 1919 by Lord Chelmsford in honor of its founder the late Jamshetji Nusserwanji Tata. The areas surrounding Jamshedpur, including Jamadoba, Noamundi and West Bokaro, are rich in minerals such as iron ore, coal, manganese and lime.

Jamshedpur is a modern industrial city, with the main industries being iron and steel, truck manufacturing, tinplate production, cement, and other small and medium scale industries revolving around these products. The city has a total population of approximately 700,000 people. Currently all civic amenities are provided by different subsidiaries of Tata Steel. JUSCO, established in August 2003, provides under one roof integrated utility services including water, power, sewerage, drainage, and solid waste management—the first and perhaps one of the few private utilities in India.

1 Tata Steel (formerly the Tata Iron and Steel Company Limited—TISCO) is Asia’s first and India’s largest integrated private sector steel company. Envisioned by Jamsetji Nusserwanji Tata and established in 1907 in the city of Sakchi, Tata Steel is today a 4 million ton steel giant.

2 Jamsetji Nusserwanji Tata (March 3, 1839-May 19, 1904) was a Parsi Zoroastrian pioneer in the field of modern industry. He was born in Navsari, Gujarat, India, and founded what would later become the Tata Group of Companies. Jamsetji Tata is generally regarded as the ‘father of Indian industry’.
Organization of Service Delivery: Pre-J USCO days

As a major industrial base of Tata Steel, Jamshedpur has received unique and substantive support from the industrial giant that has an excellent social ethos, under its overall corporate strategy. Municipal services in the city were being provided by Tata Steel's Town Division unit for over 97 years. The Town Division had been consistently providing all essential services including water supply and waste management. It faced financial constraints and was reportedly incurring a deficit of around Rs 40 crore (US$8.7 million) every year in operating various municipal services that were considered obligatory duties. The Division also suffered from limited exposure to modern world class technologies and processes. Though routine maintenance work was undertaken based on available drawings and knowledge, the Division maintained a decent level of customer satisfaction. Even though service delivery remained a non-core business area of Tata Steel since it ran the Division as a cost-center, the quality of potable water produced and supplied by the Town Division was consistent and good.

The 1990s in Jamshedpur saw a rapid population growth in the periphery of Tata Steel command areas as well as in private areas. Most of these areas were being provided with water through handpumps and deep borewells which was leading to a lowering water table and poor water quality. As a result, the demand for services in Jamshedpur was gradually on the rise and there was an additional pressure on the Town Division to expand its domain of operations and enhance the quality of services provided.

Creation of a Separate Utility and Supporting Institutional Arrangements

To address these issues, meet the growing challenges of an expanding city, and further improve service delivery, Tata Steel envisaged a corporatization model that combined improved services with financial viability. JUSCO was thus created in August 2003. The purpose of setting up a separate utility was to provide integrated world class utility services including water supply, power supply, waste management, and other allied civic services to the citizens. JUSCO was established to evolve into a full-fledged utilities provider, whose gamut of services would also include the supply of power in addition to other services, to the entire township under the Jamshedpur Notified Area Committee. Today, it is the only private operator in the country that provides comprehensive municipal services to approximately 500,000 people in the township. The initiative of converting an

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3 Jamshedpur has the status of a Notified Area Committee which is a unit of municipal administration in urban areas in the state of Jharkhand.
4 JUSCO provides services to 500,000 people out of the township’s total population of 700,000 people. Though the current coverage is at about 70 percent, it hopes to cover the entire population over the next couple of years.
JUSCO was carved out of Tata Steel’s Town Division, with the objective of providing ‘Quality Services for Life’ and improving the quality of civic services in Jamshedpur.

Management of Water and Sanitation/Sewerage Services

JUSCO provides ‘river-to-river’ water and wastewater management in Jamshedpur, including treated raw water to meet World Health Organization (WHO) drinking water guidelines, as well as the discharge of treated effluent back into the rivers to meet international effluent quality standards. It operates over a service area of 64 square kilometers and serves a 500,000 population base, with 40,000 water connections. Approximately 20,000 connections serve Tata Steel employees and the balance serve other residents of the city. Raw water is extracted from surface water sources, primarily the Rivers Subarnarekha and Kharkhai and, in an emergency, from its own stand-by reservoir at Dimna. The volume of water treated is 55 million gallons per day (MGD), distributed through a network system of 500 kilometers and seven overhead water towers.

The initial three-year agreement comprised periodic half-yearly reviews and an extension of the agreement period.

As part of this mandate, JUSCO has its vision set for the year 2008 as the preferred provider of civic and allied services, and a national leader in the water and sanitation business. Guided by Tata Values, it will continuously strive to delight customers through a team of happy and empowered employees. Today, JUSCO serves as a one-stop shop and provides various civic services in Jamshedpur that include water and wastewater services, construction services, management of municipal solid waste, power services, and integrated facility management.

JUSCO’s water works.
with a per capita supply of 250 liters per day. To ensure quality water services, a continuous monitoring of free chlorine from taps and collection of 5,000 samples is conducted every year. While potable water is supplied primarily to Tata Steel employee connections, non-Tata Steel employees and industries, industrial water is supplied to the Tata Group companies and non-Tata Group companies.

Two sewerage treatment plants with 10 pumping stations of 65 million liters a day (MLD) combined capacity receive and treat effluent through a network of 550 kilometers. While Tata Steel employees are provided water for free, other citizens pay a flat fee of Rs 120 (US$3) per month for water. In some areas where continuous water supply is being provided, customers pay between Rs 1,000-Rs1,200 (US$22-27) on a monthly basis as the water fee for receiving improved and continuous water supply services. These comprise approximately 350 customer connections that are found in the District Metering Area (DMA) zone in the Circuit House area.

JUSCO has successfully demonstrated that provision of water services to the economically backward classes is possible by a private water utility. For years Tata Steel's Town Division, (now JUSCO) provided good quality and free drinking water to the poor through 550 public standposts located across the city. Besides public standposts, poor people have also been provided free water services through borewells and handpumps. For this purpose, JUSCO has installed, commissioned and now maintains about 70 borewells with submersible pumpsets and more than 200 handpumps in various slum areas of the city.

To further improve the quality of water services, JUSCO has also undertaken a unique initiative through the Citizen-Corporate Partnership. The partnership, built through several engagement processes between the company and citizens, is based on a cost-sharing model for infrastructure developed for providing piped water services to poor people. To ensure reliable and quality piped water services to poor people, JUSCO at its own cost has developed necessary infrastructure for raw water intake, enhanced production capacity of the water treatment plant and rehabilitation work of the water distribution network. The initiative, which has been in place for the last two years, has provided for 4,000 new water connections to poor people, covering a 22,000 population. Today, these customers have a reliable service and are willingly paying a nominal tariff for using it. JUSCO is now replicating the Citizen-Corporate Partnership model in other identified slum pockets across the city.

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7 Seven water towers, spread across the town, supply water to Jamshedpur through a 500-kilometer water network spread across 40 square kilometers. The water towers have a total capacity of 46 ML; they are: Tatanagar/Bumamines WT, Kadma WT, Sakchi WT, Central WT, Sidhpora WT, and Sonari WT.
8 The non-Tata steel customers include markets, bagan (garden) areas, government, and subleased areas.
9 The Tata Group companies include Tata Steel, Tata Power, Tata Cummins, Tata Motors and the non-Tata companies include BOC and Timken.
10 The sewage treatment plant consists of two separate units with a combined treatment capacity of 65 MLD and is based on the Conventional ASP and Extended Aeration process. The treated effluent quality is claimed to exceed the requirements of Pollution Control Board norms.
11 JUSCO does not charge for the water that is provided to Tata Steel, on the understanding that all deficits in costs of operation and maintenance are covered by Tata Steel.
Planning for Transition to Improved Water Services

As part of its vision, JUSCO is constantly improving water and wastewater services through various performance improvement measures, some of which have included:

- The establishment of ISO 9001 and 14001 standards.
- The implementation of Total Productive Maintenance (TPM) for efficiency improvements in the delivery of WSS services.
- A technical tie-up with Veolia Water in 2003 for improving the management of drinking water supply and wastewater services.
- The implementation of a GIS for an improved distribution network management.
- The introduction of modern technology combined with organizational restructuring and human resource planning.

This has meant that the company has had to invest significant capital in new equipment, technology upgrades for underground asset management, modern metering facilities, and online process monitoring equipment for the technology being used.

The operator has also implemented a remarkable round-the-clock customer complaints center with specific service standard guarantees. As seen in Figure 1, all of these efforts have resulted in improvements not just in water supply coverage levels, but also in the daily hours of availability of water.

All capital expenditures for JUSCO’s transformation have been routed through Tata Steel funds. Investment proposals for performance improvement measures have had to go through a financial analysis and only proposals that satisfied conditions were put up for approval. A study group of experts from various disciplines studied these proposals and analyzed the technical, financial, environmental, and regulatory aspects of the investment proposals. Besides capital expenditure, the operation and maintenance costs for JUSCO’s operations are met from Tata Steel funds, apart from its own internal revenues. However, the intention is to make JUSCO a commercial and revenue-generating unit that could become a financially sustainable and viable operating unit. The agreement between JUSCO and Tata Steel stipulates that the parent company will provide all necessary

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**Figure 1: Coverage and availability of water supply services in JUSCO**

![Graph](image-url)

Source: JUSCO, January 2006.
support in the initial years, until the necessary infrastructure, resources, and operations are ready to make JUSCO self-sustainable.

**Technical Tie-ups**

To improve the management of drinking water supply and wastewater services and its own economic performance, Tata Steel signed a two-year partnership agreement with Veolia Water\(^1\) in July 2003. The objectives of the tie-up were that Veolia Water would provide management and technical consultancy in order to improve service efficiency, optimize the efficiency of the drinking water supply system, help Tata Steel reduce its service operation deficit, and define a customer management policy. Accordingly, Veolia Water helped Tata Steel (and later JUSCO, after it was created in 2003) in a number of ways that included the installation of meters, analysis of the water network operation, upgradation of laboratory technology for analyzing drinking water and wastewater samples, provision of advice and assistance on the development of an efficient customer management system, setting up a GIS, and training sessions for staff on subjects such as jar tests, leakage detection, hygiene and safety. It also provided project management and supplied modern operating equipment, including gas detectors, electronic metal detectors, and laboratory apparatus. The tie-up also assisted in setting up and training two leakage detection teams since water losses of 27 percent were found in the supply network during the first year of the agreement.

\(^1\) An international water services company.

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**Unaccounted-for-Water Management and Metering**

JUSCO is undertaking an Unaccounted-for-Water (UFW) monitoring program through systematic electromagnetic bulk metering at various points of its distribution network. As part of its strategy, the company has undertaken metering of the inlet connections of the system, bulk consumers, industrial connections as well as the key outlets of the system. These bulk meters are periodically read and the data downloaded for analysis. The data also form the basis for calculation of UFW in the water treatment plant, rising mains and distribution system, which is then monitored regularly to keep UFW under control.

The bulk metering program has been undertaken by JUSCO in two phases at an estimated cost of Rs 3.75 crore (approximately US$0.8 million), where Phase I involved (over 13 months) the installation of 41 bulk meters at the supply end and up to water treatment including metering of all inlets and outlets at the River Pump House for raw and clarified water, inlets and outlets at the water treatment plant, branches from the rising mains and of the tower inlets. Phase II involved the installation of 89 bulk meters over eight months including metering the reservoir outlets (distribution mains) and the connections to the other associated companies.

The exercise has helped JUSCO analyze and understand the factors that affect UFW. Once bulk meters were put in place, the various components and causes of UFW were estimated and analyzed. Leakage was identified as a major component of UFW and, as a result, the analysis included breaking up the rising mains into smaller sections for...
The operator has also implemented a remarkable round-the-clock customer complaints center with specific service standard guarantees.

ease of analysis, installing insertion probes (portable type electromagnetic meters) at strategic points in the rising mains, monitoring readings of insertion probes, and then analyzing data to further identify and understand where the losses were taking place in the system.

Constant monitoring of JUSCO’s rising mains through electromagnetic bulk meters indicated that major losses existed in the system. To identify the precise location of these losses, certain sections were prioritized and surveyed for any visible leakages and unknown connections. Once these leaks were visible, the exact location of the pipelines was identified with the help of Electronic Pipe Locators and the Ground Penetrating Radar. These leakages were then immediately repaired. The company also undertook a meticulous survey program of the rising mains for illegal and unknown connections and also sought to regularize these. As a result of this survey, many unknown connections were found in different rising mains. These connections were immediately metered or relocated after which JUSCO constantly monitored the system. As seen in Figure 2, JUSCO’s loss control and management efforts have resulted in a reduction of UFW in the rising mains and the industrial water network.

The drive to constantly reduce UFW levels followed JUSCO’s realization that every kiloliter (KL) of water lost results in huge revenue losses for the company. Given that the total potable water production is 180 MLD, even a 1 percent reduction in UFW per day amounts to a saving of 1,800 KL per day, which translates to a saving of Rs 4.25 lakh (US$9,444) per month.13 This ‘saved’ water could then be redistributed to service areas that are not receiving adequate water supply. JUSCO is now working on a plan to implement customer meters for all its 40,000 household connections.

Setting up a District Metering Area

Besides rigorous monitoring of UFW and installation of electromagnetic bulk meters at all points of the distribution and network system, JUSCO has also implemented the concept of a District Metering Area (DMA) in certain pockets of the system to provide continuous water supply. The principle is based on the measurement and monitoring of total flows into a pre-defined area that has a metered source of water and hydraulically closed boundaries, where the area must be ‘segregated’ from the network through the operation of valves to ensure that metered supplies are the only

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13 This is calculated as water saved per month being 54,000 KL at a cost of Rs 7.90 (US$0.18) per KL.
water source. JUSCO has created one DMA zone with continuous water supply in an area that spans over 1.83 square kilometers and serves 350 households and the network in the DMA is over 75 years old. This area is constantly monitored to check if the pressure and leakage levels through continuous water supply are at the optimum. JUSCO reports that there have been no customer complaints of water scarcity and poor pressure in the area since the implementation of the DMA.

It took JUSCO approximately six months to design and implement the DMA. The area mostly comprises high-end consumers who pay Rs 1,000-Rs 1,200 (US$22-US$27) a month for continuous supply of safe drinking water.

**GIS Mapping**

JUSCO has also set up a GIS for establishing detailed knowledge of its underground assets that would also eventually enable the efficient operation of the network and help control water loss levels. The GIS has helped JUSCO establish the asset database and enables it in planning future network rehabilitations and expansions, besides helping in modeling for analyzing low water pressure. The GIS technology also helps JUSCO in improving preventive maintenance and planning for capital investments. The system is linked to the complaint resolution system so that once a complaint is made, it helps in identifying the source of the problem and the exact details of the network that are causing the problem in service.

**Table 1: Total Productivity Maintenance Objectives set up by JUSCO**

- Zero accidents and enhance employee morale.
- Zero breakdowns/interruptions to increase production and productivity.
- Zero customer complaint through enhancing service levels.
- Hundred percent conformance to quality norms.

Source: JUSCO. January 2006.

**Table 2: Total Productivity Maintenance Objectives for ‘Kargil’ Circle**

- Keep the plant clean.
- Stop water leakages, spillage of lubricants, chemicals.
- Increase availability of equipment.
- Follow safety rules.
- Follow procedures and work instructions.
- Eliminate hard-to-access areas.
- Maintain clarified water quality within 15 Nephelometer Turbidity Units.
- Reduce chemical costs.

Source: JUSCO. January 2006.

**Total Productive Maintenance and Computerized Maintenance Management System**

JUSCO has adopted the TPM principle, a manufacturing-led initiative that emphasizes the importance of people in operating technology and is a ‘can do’ and ‘continuous improvement’ philosophy demonstrating the importance of production and maintenance staff working together. TPM is a unique Japanese system, which has been developed based on productive maintenance concepts and methodologies, a technique that looks at categorizing maintenance as corrective maintenance, preventive maintenance, predictive maintenance, and detective maintenance. Currently, the technique is carried out by all staff through small group activities. Implemented since December 2004, the initiative targeted the involvement of the lower level staff in maximizing water production so that they felt a sense of ownership of the machinery that they worked with.

The TPM principle divides the entire service operating area into smaller areas of operation, called Circles. Each Circle has its own specific objectives (Table 1) based on an analysis of its shortcomings and problem areas. For instance, one of the Circles—named ‘Kargil’—specified its objectives for improving its operational efficiencies (detailed in Table 2).
JUSCO is also undertaking a monthly benchmarking exercise of its own operational performance for the water services that it provides. These benchmarks include employee productivities achieved in terms of water and sewage treated per employee.

Based on these objectives, specific actions are taken so that the Circle successfully meets its specified performance targets. These targets are monitored continuously on a monthly basis to understand the impact of the actions and whether any improvements are being realized as a result of these interventions. Besides constant monitoring of machinery performance standards, the TPM initiative also stresses the importance of recording the status of the machinery prior to and after specific actions are undertaken for improving plant machinery. For instance, some initiatives undertaken in the ‘Kargil’ Circle for bringing about improvements in machinery efficiency included monitoring the availability and efficiency of pumps on a monthly basis and comparing efficiency levels to the previous year’s achievements, undertaking various measures for improving efficiency of pumps like stopping spillage and leakages, constant repairing of pumps to arrest wear and tear, and so on. A monthly monitoring of these efficiency levels and performance targets helped the ‘Kargil’ Circle further improve the efficiency of pumps and other machinery.

Whether these improvement initiatives are having an impact on the overall operations of water services is also being monitored by JUSCO on a periodic basis through productivity benchmarks. These benchmarks include employee productivities achieved for water and sewage treatment by looking at the quantity of water and sewage treated per employee. These indicators are also compared with international benchmark standards so as to further drive performance improvements to reach international benchmarks.14

Besides TPM, the Computerized Maintenance Management System ensures efficient management of daily tasks and resource allocation while recording the experience of maintenance technicians on a day-to-day basis. The system also helps capture and analyze data through work order modules as well as monitor asset condition and serviceability through Equipment Modules. The initiative helps in inventory control, equipment management and work order details, and to keep a tighter control over work obligations of various vendors that JUSCO engages with.

**Benchmarking Own Operational Performance**

JUSCO is also undertaking a monthly benchmarking exercise of its own operational performance for the water services that it provides. This is being

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14 These benchmarks were adopted from the Qualserve Benchmarking Program—a joint program of the American Water Works Association (AWWA) and the World Economic Forum (WEF)—on benchmarking 2012 American water utilities.
undertaken through the Balance Scorecard that helps JUSCO monitor its performance on four aspects, that is, financial aspects, service delivery aspects for the customer, internal business processes, and community concerns. Each aspect is defined through an objective that is to be achieved on a yearly basis as part of a business operating unit, with specific indicators or strategic measure areas that are to be monitored to bring about performance improvements within the operating practices of JUSCO. Each indicator or benchmark is monitored against the previous year’s data and also against target levels that are set by JUSCO on a yearly basis. The data are published and are common knowledge to the consumer as well. Details of the Balance Scorecard along with the specific measures to introduce operational and commercial efficiencies are given in Table 3.

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Business Unit Objective</th>
<th>Strategic Measure</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>Maximize revenue generation from water supply within Jamshedpur service area</td>
<td>Revenue from potable water in command area Revenue from other businesses Revenue from potable water in bagan area Revenue from clarified water Revenue from raw water</td>
<td>Rs lakhs(^a) Rs lakhs Rs lakhs Rs lakhs Rs lakhs</td>
</tr>
<tr>
<td>Customer-related service delivery</td>
<td>Improve quality and speed in service levels</td>
<td>Customer Satisfaction Index Complaints related to water supply and sewerage services Repeat complaints (water supply and sewerage) Compliance within time (water supply and sewerage) Potable water quality at customer’s tap (free chlorine content = 0.2 mg/l) Potable water quality at customer’s tap (bacteriological [coliform] content &lt;2.2 MPN/100 ml(^b))</td>
<td>% % water &amp; sewerage connections % of total complaints % of total complaints % conformance % conformance</td>
</tr>
<tr>
<td>Modernize and upgrade potable water distribution network and ensure equitable potable water supply</td>
<td>Service availability water supply Number of 24x7 customers UFW (distribution network) Leakage pipe breaks/pipe bursts</td>
<td>Hours per day Numbers % Breaks/km/year</td>
<td></td>
</tr>
<tr>
<td>Maximize/expand potable water service coverage in J amshedpur</td>
<td>Water supply service coverage New customers (includes regularization)</td>
<td>% of population Numbers</td>
<td></td>
</tr>
<tr>
<td>Ensure 100% sewage collection and treatment in J amshedpur</td>
<td>Sewerage service coverage</td>
<td>% of population</td>
<td></td>
</tr>
</tbody>
</table>

Notes: (a) 10 lakh = 1 million; (b) MPN stands for ‘Most Probable Number’ of coliform bacteria.

Continued on next page
To meet international standards, and specific water quality tests, JUSCO also conducts regular surveys on water quality and customer satisfaction to bring about customer focused improvements in service delivery.

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Business Unit Objective</th>
<th>Strategic Measure</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Business Processes</td>
<td>Modernize and upgrade operating facilities for sustenance (water production and sewage treatment)</td>
<td>Pump availability (overall) Drawn from Dimna Potable water production Raw water production Clarified water production Sewerage blockages Sewage treated</td>
<td>% MLD (annual average) MLD (annual average) MLD (annual average) MLD (annual average) Blockage/km/year MLD (annual average)</td>
</tr>
<tr>
<td></td>
<td>Improve operation and maintenance efficiencies and practices with optimized cost</td>
<td>SPC potable water* SPC raw water SPC clarified water SPC Bara Sewerage Treatment Plant SPC Kharkhai Sewerage Treatment Plant Power costs Expenditure on capital Processing of contractor's bills Chemical cost at Water Treatment Plant Chemical cost at River Pump House UFW (rising mains) UFW (raw water to associated companies) UFW (clarified water)</td>
<td>MWh/ML* MWh/ML MWh/ML MWh/ML MWh/ML % of operating costs % of approved expenses % processed w/i 15 days Rs/MLc Rs/ML % %</td>
</tr>
<tr>
<td></td>
<td>Develop skills to provide employees with saleable skills</td>
<td>Number of reportable accidents Employee skill enhancement Personal Development Plan compliancea Small Group Activities (Total Productive Maintenance Circles) involvement Circles solved Knowledge Management Index Knowledge Management Sub-community Index Suggestions accepted Suggestions implementation Savings from suggestion implementation</td>
<td>Numbers Numbers/Circle/quarter Index/Officer Knowledge Management Index No/employee/year No/employee/year Rs/employee</td>
</tr>
<tr>
<td>Community</td>
<td>Conserve water resources in community</td>
<td>Implement rain water harvesting projects</td>
<td>Number of locations</td>
</tr>
</tbody>
</table>

Notes: (a) SPC stands for Specific Power Consumption; (b) MWh/ML stands for million watt hour per million liter; (c) Rs/ML stands for rupees per million liter; (d) Personal Development Plan refers to training programs undertaken for staff to address and improve their functional and management gaps. Source: JUSCO. January 2006.
Service Standard Monitoring

JUSCO’s water management services are ISO:9001-2000 certified. To ensure that water quality is up to the mark, the company analyzes over 5,000 samples every year from customer taps, storage tanks, treatment works, and water tankers (Table 4) to ensure consistent water quality that conforms to the Bureau of Indian Standards and World Health Organization guidelines. Some of the water quality indicators that are monitored include Biological Oxygen Demand, turbidity, pH, Total Suspended Solids, Total Dissolved Solids, alkalinity, hardness, chloride, iron, calcium, magnesium, sulphate, fluorine, ammonia, nitrate, nitrite, Dissolved Oxygen, arsenic, cadmium, cyanide, E. Coli, fecal coliform and Chemical Oxygen Demand. As demonstrated in Figure 3, there has been a continuous improvement in water quality and, currently, more than 95 percent of the potable water samples tested for free chlorine and bacteriological quality conform to the standard norms.

Besides specific water quality tests, JUSCO also conducts regular customer satisfaction surveys to bring about customer focused improvements in service delivery. JUSCO has so far conducted three sample surveys. The specific areas of service satisfaction are then monitored by comparing performance standards from international and national best practice utilities so as to drive and trigger performance improvements within JUSCO to meet these best practice standards.

Table 4: Categorization of the various water quality sample tests undertaken by JUSCO

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Prior to 2004</th>
<th>2004 Onwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteriological samples</td>
<td>3,500</td>
<td>5,650</td>
</tr>
<tr>
<td>Chlorine analysis</td>
<td>3,500</td>
<td>11,500</td>
</tr>
<tr>
<td>Chemical analysis (water)</td>
<td>1,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Chemical analysis (sewage)</td>
<td>700</td>
<td>1,600</td>
</tr>
</tbody>
</table>

Source: JUSCO. January 2006.

Figure 3: Water quality standards

Source: JUSCO. January 2006.
Besides the customer keeping a check on whether the complaints are being redressed, JUSCO Sahyog Kendra has an effective monitoring system to understand the effectiveness of such a system and its compliance to specific service standards.

<table>
<thead>
<tr>
<th>Service Category</th>
<th>Sub-category</th>
<th>Complaint Area</th>
<th>Job Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Management</td>
<td>Water Management Jobs</td>
<td>Plumbing outside the house</td>
<td>WPW01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Contamination of water</td>
<td>WPW02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water scarcity</td>
<td>WPW03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pipe leakage outside the house</td>
<td>WPW04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pipe burst outside the house</td>
<td>WPW05</td>
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<tr>
<td></td>
<td></td>
<td>Masonry work outside the house</td>
<td>WPW06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sewer obstruction outside the house</td>
<td>WPW07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repairs to drains behind the house</td>
<td>WPW08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repairs to manhole</td>
<td>WPW09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overflow from overhead tank</td>
<td>WPW10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inlet pipe leakage coming from outside the house</td>
<td>WPW11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cleaning of overhead tank</td>
<td>WPW12</td>
</tr>
</tbody>
</table>


For instance, an area where customer feedback is received is inadequate water supply or customer dissatisfaction with the duration of water supply. In such a case, feedback is sought on the areas of dissatisfaction with water supply services. Simultaneously JUSCO also identifies the related process that could be impacting the water service network, and hence services, including the water distribution network, the management of water service delivery, and infrastructure refurbishments. Each of these identified related processes are then looked into and the performance of each process is monitored through ‘in-process’ indicators like UFW, pipe breaks, and compliance to plans or through ‘end process’ indicators such as daily hours of water supply, per capita water consumption, and proportion of investments in operating revenues. These ‘in-process’ and ‘end-process’ indicators are then compared to similar national benchmarks to see where JUSCO stands, so that constant operational improvements can be undertaken for bettering these benchmarks.

**A Best Practice Example on Customer Grievance Service**

JUSCO also set up an effective round-the-clock complaint resolution cell in November 2004 for effectively addressing the grievances of its 500,000 customers. Prior to the initiative, customers had to lodge complaints through 15 different complaint numbers to different units that were responsible for the various services being provided. This caused dissatisfaction among consumers as complaints were being redressed but with varying response time and quality of service response. JUSCO Sahyog Kendra (or JUSCO Assistance Center) was hence set up as a single window complaint logging and follow-up system that would provide greater care to the residents of Tata Steel's service area with the facility being available 24 hours a day, seven days a week. Set up as an interface between the customer and the service provider, the initiative ensures that all requests are lodged, tracked, and monitored from a single point to enable the creation of a centralized database that provides facts and figures about the service levels that are being provided by JUSCO, so that service deficiencies can be identified and
service quality continuously improved. The entire operating area is divided into seven customer complaint zones based on the physical proximity of the delivery points. There is an efficient follow-up system for customers to check the status of their requests, with effective tracking of customer feedback for continuous improvement of services and for improvements in response time for redressing complaints.

A consumer makes a call to the complaint number—2146000—and is required to identify herself/himself by a phone number, a customer ID, and the location from where she/he is calling. The location is GIS mapped to any one of the seven consumer complaint zones. Next the consumer lodges the complaint by specifying the details and the particular complaint code as listed in the JUSCO Sahyog Kendra complaint booklet. The complaint booklet lists complaints according to eight different service categories classified as Town Electrical, Integrated Customer Service, Water Management, Planning Engineering and Construction, Public Health, Fleet Management, Billing and Customer Care, and Horticulture. Each of these service categories are further subcategorized into respective areas of work. For instance, the service category Town Electrical is further subcategorized into four categories—House Maintenance, Street Light, Meter in House, and Service and Transmissions—which then have particular job codes for each area.

The management of water services is also similarly categorized, details of which are found in Table 5 along with their respective job codes.

After the consumer has made a complaint regarding a particular service that she/he is dissatisfied with, the JUSCO Sahyog Kendra first registers the complaint in its central database, with a customer ID and the nature of the complaint as identified by the relevant job code. It then puts in a request for addressing the complaint by categorizing the complaint according to the relevant department and sending it to the relevant department for consideration. A job card is simultaneously printed at the concerned zone and is sent to the allocated employee/contractor for complaint redressal. In case of infrastructure problems, the complaint resolution system is inked to the GIS mapping system of JUSCO, which helps to pin down the location specifics of the complaint. This helps in identifying the exact area of concern and taking

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15 These complaint zones include Sonari, Kadma, Central, Bistupur, Salchi, Sido, and Burma Mines.
16 The JUSCO Sahyog Kendra complaint booklet contains a comprehensive listing of services/jobs that are being provided by JUSCO. It helps the consumer give the exact job code details while lodging her/his complaint.
A unique feature about the working of complaint resolution under JUSCO Sahyog Kendra is that, once the complaint is registered, the consumer is given a Service Level Guarantee that is the maximum time that the respective service department is expected to take to redress the complaint.

Corrective action to prevent the occurrence of similar problems in the future. Once the job is completed, the job card must be filled in by the consumer indicating her/his satisfaction with the actions taken to resolve the complaint. The job card must also be signed by the concerned employee contractor before being handed back to the department/employee who was responsible for resolving the complaint. The employee/department regularly updates the database for the review at the Kendra.

### Table 6: Service Level Guarantees for water management services

<table>
<thead>
<tr>
<th>Job Type</th>
<th>Service Level Guarantee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overflow from overhead tank</td>
<td>3 days</td>
</tr>
<tr>
<td>Drinking water scarcity</td>
<td>3 days</td>
</tr>
<tr>
<td>Inlet pipe leakage coming from outside the house</td>
<td>3 days</td>
</tr>
<tr>
<td>Pipe leakage/burst outside the house</td>
<td>3 days</td>
</tr>
<tr>
<td>Sullage water/wastewater/backside drain</td>
<td>15 days</td>
</tr>
<tr>
<td>Cleaning of overhead tank</td>
<td>3 days</td>
</tr>
<tr>
<td>Storm water/rain water/front side drain repair</td>
<td>15 days</td>
</tr>
</tbody>
</table>


In addition to the customer keeping a check on whether the complaints are being redressed, JUSCO Sahyog Kendra has an effective monitoring process to understand the effectiveness of such a system and its compliance to specific service standards. The unit randomly picks up about 100 cards daily and calls the concerned customers to check if the problem was addressed and whether the customer was satisfied with the action that was taken for addressing the complaint. Typically about 850 complaints are registered on a daily basis, and the time taken, in peak hours, to register a complaint is about 90 seconds. Of the total complaints received, about 85 percent are related to civil works and the remaining are engineering complaints. JUSCO Sahyog Kendra also has a system for registering repeat complaints and recurrence of already addressed complaints. In such a case, a detailed analysis is undertaken of when the complaint was initially addressed, what the
Jamshedpur Utilities and Services Company Limited: Improving WSS Services through Private Sector Partnerships

Table 7: Indicators for monitoring the complaint resolution system

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLG: Service Level Guarantee</td>
<td>Maximum time that service departments expect to take to redress a complaint. Also called expected compliance time</td>
</tr>
</tbody>
</table>
| SLP: Service Level Performance | Actual performance against SLG, called compliance within time  
SLP = \( \frac{\text{Number of complaints within SLG}}{\text{Total number of complaints with defined SLG}} \) |
| SLE: Service Level Expectation | Average time a customer can tolerate to get his complaint redressed |
| ATAT: Actual Turnaround Time | Time taken by JUSCO service departments to resolve a particular customer complaint |
| CG: Capability Gap | Inability of JUSCO services to promise a service level that matches customer expectation  
Capability Gap = SLG - SLE |
| SG: Service Gap | Gap between ATAT and SLG, also called compliance beyond time  
Service Gap = ATAT - SLG |
| QG: Quality Gap | Sum total of capability gap and service gap  
Quality Gap = ATAT - SLE |

Source: JUSCO Sahyog Kendra, January 2006.

perceptions of the customer were and why the complaint was not satisfactorily addressed.

A unique feature about the working of complaint resolution under JUSCO Sahyog Kendra is that once the complaint is registered the consumer is given a Service Level Guarantee (SLG) that is the maximum time that the respective service department is expected to take to redress the complaint.

In April 2005, 8 percent complaints logged by the Kendra fell off the system since there was either no defined SLG for some complaints or no review mechanism was instituted for them. These SLGs are defined for a specific set of complaint redressal being undertaken by JUSCO Sahyog Kendra. SLGs for the water services complaint redressals are indicated in Table 6.

The customer is also given a complaint reference number to check on the status of complaint redressal. Tata Steel employees can check the status of the complaint on the company’s intranet. Besides this, the unit also monitors the compliance time within which customer complaints are being solved. Once the SLGs are indicated on the job cards and in the database system, JUSCO Sahyog Kendra also monitors Service Level Performance which indicates the actual performance against SLG. This is also termed as compliance within time and is defined as the ratio of the number of complaints that were resolved within the SLGs to the total number of complaints with defined SLGs. Another means of monitoring whether complaints are meeting the SLGs has been to track and monitor the Service Gap which is the gap between Actual Turnaround Time, for example, how long it took JUSCO to resolve the complaint and the respective SLG.

The unit also tries to estimate the Service Level Expectation (SLE) which indicates the average time a customer
JUSCO’s operations have demonstrated that the provision of urban services needs to be looked at as a viable business activity and not merely as an obligation.

Table 8: Monitoring complaints for water management services

<table>
<thead>
<tr>
<th>Job Type</th>
<th>Service Level Guarantee</th>
<th>Service Level Expectation</th>
<th>Actual Turnaround Time</th>
<th>Capability Gap (SLG-SLE)</th>
<th>Service Gap (ATAT-SLG)</th>
<th>Quality Gap (ATAT-SLE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overflow from overhead tank</td>
<td>3 days</td>
<td>1 day</td>
<td>3 days</td>
<td>2 days</td>
<td>0 days</td>
<td>2 days</td>
</tr>
<tr>
<td>Drinking water scarcity</td>
<td>3 days</td>
<td>1 day</td>
<td>6 days</td>
<td>2 days</td>
<td>3 days</td>
<td>5 days</td>
</tr>
<tr>
<td>Inlet pipe leakage coming from outside house</td>
<td>3 days</td>
<td>1 day</td>
<td>4 days</td>
<td>2 days</td>
<td>1 day</td>
<td>3 days</td>
</tr>
<tr>
<td>Pipe leakage/burst outside the house</td>
<td>3 days</td>
<td>1 day</td>
<td>5 days</td>
<td>2 days</td>
<td>2 days</td>
<td>4 days</td>
</tr>
<tr>
<td>Sullage water/wastewater/backside drain</td>
<td>15 days</td>
<td>5 days</td>
<td>21 days</td>
<td>10 days</td>
<td>6 days</td>
<td>16 days</td>
</tr>
<tr>
<td>Cleaning of overhead tank</td>
<td>3 days</td>
<td>3 days</td>
<td>4 days</td>
<td>0 days</td>
<td>1 day</td>
<td>1 day</td>
</tr>
<tr>
<td>Storm water/rain water/frontside drain repair</td>
<td>15 days</td>
<td>5 days</td>
<td>16 days</td>
<td>10 days</td>
<td>1 day</td>
<td>11 days</td>
</tr>
</tbody>
</table>


tolerates the problem before it is redressed. Constant feedback from the customer, either from job cards or from customer surveys undertaken by JUSCO periodically, helps estimate the SLE. JUSCO Sahyog Kendra monitors this continuously by keeping track of the Capability Gap, which is defined as the difference between the SLG and the SLE. The Capability Gap is a result of the inability of JUSCO services to promise a service level that matches customer expectation. Finally, the unit also monitors the Quality Gap, which is the sum total of Capability Gap and the Service Gap and is the difference between Actual Turnaround Time and SLE. This indicator is constantly reviewed and revised so that service levels can be brought closer to customer expectations. These indicators, as monitored for water services operations, are given in Table 8.

In fact, after receiving continuous customer feedback, and after reviewing and monitoring each of these service indicators, JUSCO has taken stringent measures. In many cases, SLGs have been revised to bring them closer to customer expectations. As seen in

Figure 4: Compliance of overhead tank overflow complaints

Source: JUSCO. January 2006.
Figure 4, after monitoring response time to resolving complaints on overhead tank overflows, JUSCO has now amended its Actual Turnaround Time from three days in the first three quarters of 2005, to the present level of one day.

By closely monitoring the complaints being registered for the services that it provides to its customers, JUSCO is able to identify the operational inefficiencies of many of its service departments. For instance, for water management services, 62 percent complaints in this fiscal for water services were of the water wastage type, of which 31 percent complaints were due to overflow. This has helped the company focus more strongly on measures to reduce UFW. As a result of constant monitoring of service standards, JUSCO has improved its services.

As seen in Figure 5, JUSCO’s compliance with the stipulated SLG for water supply and sewerage has increased over the last two years and, in fact, in the current fiscal has superseded its own target level.

There has also been a fall in the number of repeat repair complaints registered with JUSCO Sahyog Kendra, as demonstrated in Figure 6.

**Conclusion**

Performance improvement measures implemented by JUSCO have resulted in impressive service delivery outcomes including increase in water services coverage, availability, reliability, efficiency, and customer orientation.

JUSCO’s operations have demonstrated the benefits of treating
ABOUT THE SERIES

WSP Field Notes describe and analyze projects and activities in water and sanitation that provide lessons for sector leaders, administrators, and individuals tackling the water and sanitation challenges in urban and rural areas. The criteria for selection of stories included in this series are large-scale impact, demonstrable sustainability, good cost recovery, replicable conditions, and leadership. The purpose of this series is to document and draw on the successful private sector experiences being undertaken in the WSS sector in the region.

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the provision of urban services as a viable commercial activity and not merely as an obligation. This was enabled through the establishment of a separate professional and focused group in JUSCO with civic and allied services as its core business that was to deliver and manage municipal services in Jamshedpur. However, JUSCO does not yet provide continuous water supply in all areas of operation due to the absence of customer meters and consumption-based tariffs in most of its service areas.

As a result of its commercialized operations, JUSCO’s revenues for water service operations have increased by more than 35 percent from Rs 15.5 crore (approximately US$3.4 million) in fiscal 2005 to Rs 21 crore (approximately US$4.6 million) in fiscal 2006, and it is implementing a program for improved cost recovery and financial viability. Currently JUSCO’s parent company, Tata Steel, subsidizes any revenue shortfall due to free provision of water to its employees and provides an operating subsidy to JUSCO until it achieves financial viability.

The experience in Jamshedpur is already benefiting other cities and towns in the region. Some of the study tour participants from Bangladesh and Pakistan (see Box on page 15) report that they are implementing customer service improvements based on what they saw in Jamshedpur. Further, other government and semi-government bodies like the Haldia Development Authority along with the Public Health Engineering Department, West Bengal, have recognized the benefits of JUSCO’s initiatives and are exploring options for tying up with JUSCO to improve their own water and wastewater management.
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☐ Yes  ☐ No

2. Is the field note a comfortable length to read?  
☐ Yes  ☐ No

3. If no, would you prefer  
☐ more details/data  ☐ less details/data

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   i) 
   ii) 
   iii) 

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