

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.¹ 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.² 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. Jamshedpur Utilities and Services Company Limited (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-JUSCO 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



New River Pump House.

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.³ Today, it is the only private operator in the country that provides comprehensive municipal services to approximately 500,000 people in the township.⁴ The initiative of converting an

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.



JUSCO's water works.

obligatory service into a commercial customer-oriented company to provide municipal services with a high degree of user satisfaction is also the first of its kind in the country.

JUSCO is a wholly owned subsidiary of Tata Steel and was created on August 25, 2003, under the Companies Act 1956, with the objective of providing 'Quality Services for Life'. It was carved out of Tata Steel's Town Division and spun off as a separate company with the mandate of improving the quality of civic services in Jamshedpur and turning it into a model town with world class facilities. A partnership between Tata Steel and JUSCO formalized this relationship through an agreement with clearly defined performance standards.

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.

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 rivers⁵ 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.⁶ 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,

⁵ While JUSCO provides 99 million liters a day (MLD) of raw water and 72 MLD of clarified water to industrial connections, its potable water production includes 29 MLD to industrial connections, 19 MLD to commercial connections, and 120 MLD to domestic connections. Two pumping stations produce water: the New River Pump House (set up 20 years ago) produces clarified water for industrial use; the Old River Pump House (set up in 1932, with many upgradations thereafter) produces clarified water and raw water for industrial use and for the Town water works from where potable water is supplied to JUSCO customers via water treatment plants. The Old River Pump House has a raw water pumping capacity of 342 MLD and a clarified water pumping capacity of 136 MLD. The Town works has a water treatment plant that was first commissioned in 1921 with an 11 MLD capacity and was upgraded subsequently many times. It has a potable water production capacity of 168 MLD, with potable water quality conforming to Bureau of Indian Standards (BIS) and WHO norms.

⁶ The Dimna Reservoir has a capacity of 34,000 million liters (ML).

with a per capita supply of 250 liters per day.⁷ 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 employees⁸ and industries, industrial water is supplied to the Tata Group companies and non-Tata Group companies.⁹ 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.¹⁰ While Tata Steel employees are provided water for free, other citizens pay a flat fee of Rs 120 (US\$3) per month for water.¹¹ 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.



Booster pumps at the water works.

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/Burmamines WT, Kadma WT, Sakchi WT, Central WT, Sidhgora 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 sewerage 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.

Tata Steel signed an agreement with Veolia Water to provide management and technical consultancy for improving efficiency in the delivery of WSS services.

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:

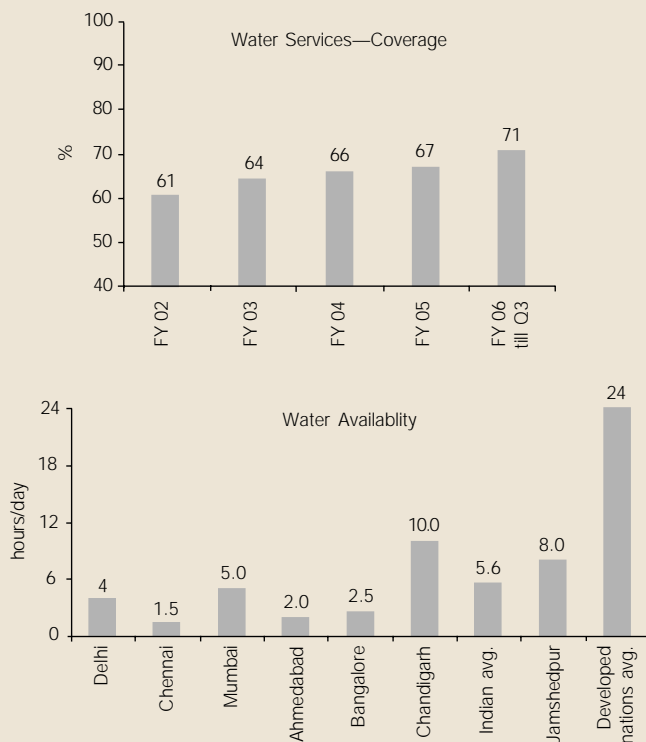
- The establishment of ISO 9001 and 14001 standards.
- The implementation of Total Productive Maintenance (TPM) for efficiency improvements in the delivery of WSS services.
- A technical tie-up with Veolia Water in 2003 for improving the management of drinking water supply and wastewater services.
- 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.

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



Source: JUSCO. January 2006.

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

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 Water¹² 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.

¹²An international water services company.



Water conservation tips displayed at various locations in the city.

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.

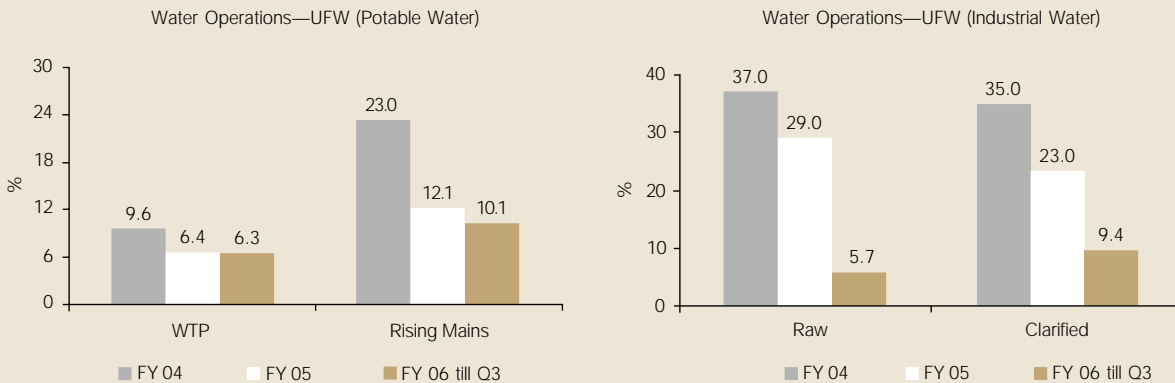
The bulk metering program has been undertaken by JUSCO in two phases at an estimated cost of Rs 3.75 crore (approximately US\$0.8 million), where

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.

Figure 2: Unaccounted-for-Water levels in JUSCO



Source: JUSCO. January 2006.

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

¹³This is calculated as water saved per month being 54,000 KL at a cost of Rs 7.90 (US\$0.18) per KL.

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

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



One of the seven water towers in the city.

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 202 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 3: Details on JUSCO's Balance Scorecard

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

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

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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.

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

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, fluoride, 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.

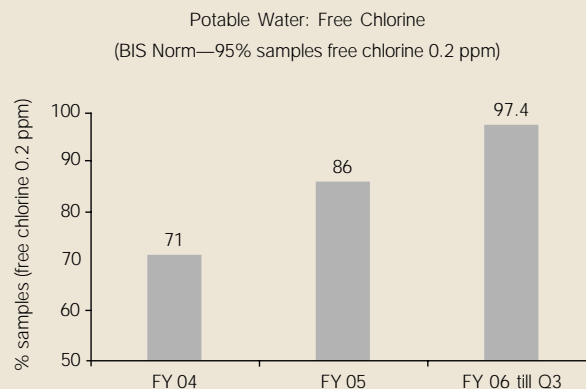
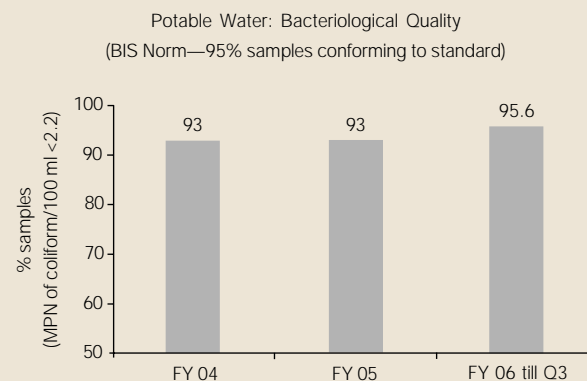
Besides specific water quality tests, JUSCO also conducts regular customer satisfaction surveys to bring about customer focused improvements in service delivery. JUSCO has so far conducted three sample surveys. The specific areas of service satisfaction are then monitored by comparing performance standards 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

Sample Type	Prior to 2004	2004 Onwards
Bacteriological samples	3,500	5,650
Chlorine analysis	3,500	11,500
Chemical analysis (water)	1,000	3,000
Chemical analysis (sewage)	700	1,600

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 5: Categorization of water management complaints by JUSCO *Sahyog Kendra*

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

Source: JUSCO *Sahyog Kendra*. January 2006.

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.¹⁵ 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.¹⁶ 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 categorized 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

¹⁵ These complaint zones include Sonari, Kadma, Central, Bistupur, Sakchi, Sidhgora, and Burma Mines.

¹⁶ The JUSCO *Sahyog Kendra* customer 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.

Regional team's visit to Jamshedpur

A team of senior government and utility officials from Pakistan and Bangladesh visited Jamshedpur in January 2006 to see the operations of the town's private water supply provider, JUSCO. This Field Note is based on their findings and experience gathered during the exposure visit.



Water utility managers from cities in Bangladesh and Pakistan with WSP staff.

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

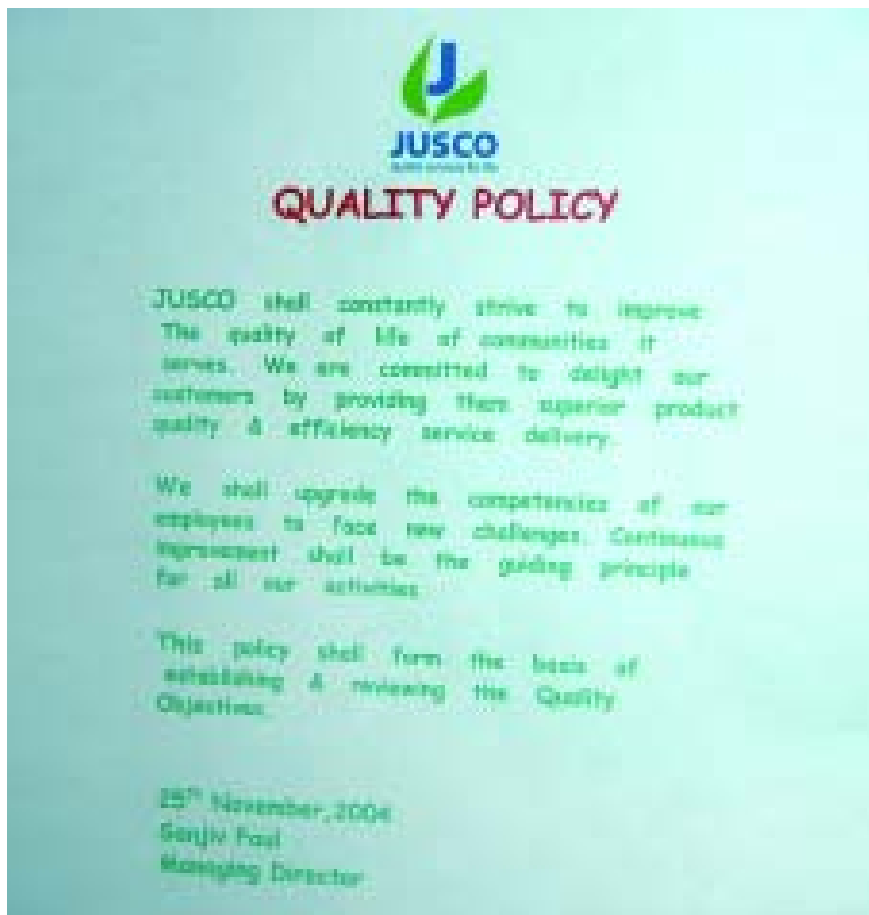
A unique feature about the working of complaint resolution under JUSCO *Sahyog Kendra* is that, once the complaint is registered, the consumer is given a Service Level Guarantee that is the maximum time that the respective service department is expected to take to redress the complaint.

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

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

Source: JUSCO *Sahyog Kendra*. January 2006.



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

Table 7: Indicators for monitoring the complaint resolution system

Indicator	Definition
SLG: Service Level Guarantee	Maximum time that service departments expect to take to redress a complaint. Also called expected compliance time
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

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

Source: JUSCO Sahyog Kendra. January 2006.

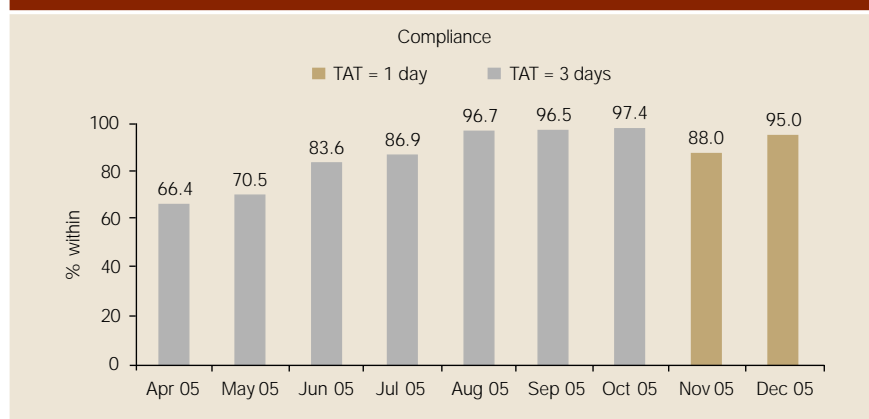
tolerates the problem before it is redressed. Constant feedback from the customer, either from job cards or from customer surveys undertaken by JUSCO periodically, helps estimate the

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

Figure 5: Compliance with customer complaints on water supply and sewerage services

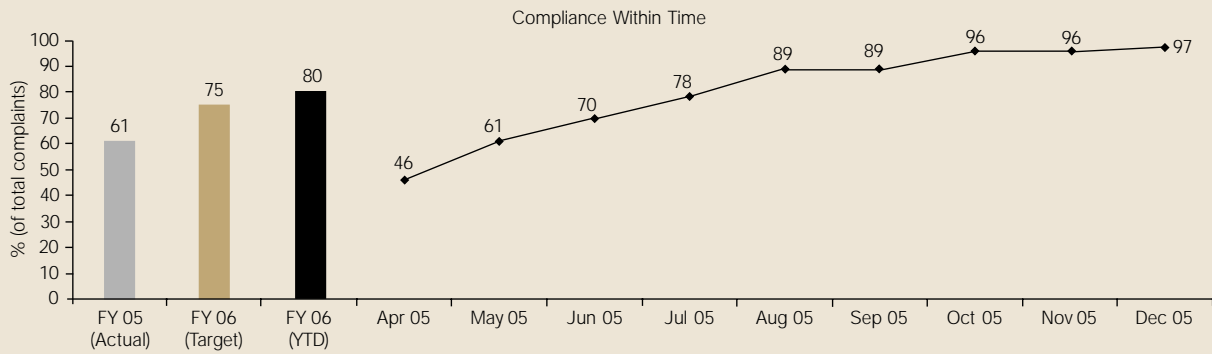
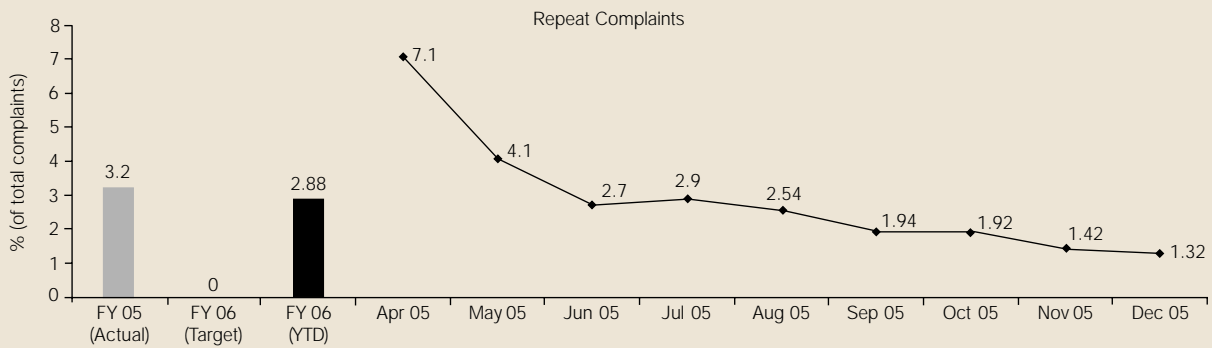


Figure 6: Repeat complaints for water supply and sewerage services



Source: JUSCO. January 2006.



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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.

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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