Standardisation Project
„Water Services“
ISO TC 224

Consequences on Operational Practice
(Wastewater Services)

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Rohrhofer & Partner / Vienna (AUT)
ISO Standard 24500 Series

Management of Utilities and Assessment of Services in the Water and Wastewater Sector

- Scope
- Components
- Objectives
- Guidelines for the Management
- Service Quality Assessment
- Related Performance Indicators (PIs)
- Use of PIs for Operation
ISO Technical Committee 224

- Secretariat and Presidency from France
- 4 Working Groups
  - WG 1 – Definitions 
  - WG 2 – Service to Users 
  - WG 3 – Water Supply 
  - WG 4 – Wastewater 

ISO member countries can participate also international water / consumer bodies and organizations 

[Supported by Austrian Federal Life Ministry, BMLFUW]
DIS 24510
Guidelines for the Improvement and for the Assessment of the Service to Users

DIS 24512
Guidelines for the Management of Drinking water Utilities and for the Assessment of Drinking water Services

DIS 24511
Guidelines for the Management of Wastewater Utilities and for the Assessment of Wastewater Services

Status Quo: DIS-Stage; finalization: beginning of 2007
Components of the Services

Objectives

Actions to follow (Guidelines)

Assessment Criteria

Performance Indicators

Performance vs. Assessment

ISO 24500 Series

PDCA (plan-do-check-act)
Schematic of WW Services

Source: IWA Handbook

Pls for Wastewater

Rohrhofer & Partner / Vienna (AUT)
Types of WW Systems

Source: Hydroconseil France
Example: REPAIRS

Objectives
the Users expect:
repair in approp. time
information in time
minimum disturbance

Guidelines
the Service Supplier shall:
inform user about time, duration and consequences
minimize disturbance

Assessment Criteria
Consequences of service interruption:
execution in planned time
extent of user information

Average Interruption Time
Interruption per Connection

Pls

How to use ISO 24500 Series …
Objective: Protection of Public Health

SAFE DISCHARGE OF WASTEWATER

PI: WWTPs compliance with discharge consents (%)

Definition:
Percentage of the population equivalent that comply with the applicable discharge consents

Comment:
Discharge consents refer to the effluent quality standards that apply.
The ISO Standards 24510 / 24511 / 24512

- provide a common language
- are applicable, both in the industrialized and in the developing world
- give guidance for the management and the assessment of Water Supply and Wastewater Services
- provide tools (PIs) to make these services visible and measurable.
Levels of Details

- Principles; Objectives
- Functional Requirements
- Detailed Guidance
- Client Specification Documents
- Performance Indicators; National Standards

Source: Drs.ing. C. Snaterse MMC / NL
Performance Indicators (PIs)

- ... are tools to measure performances
- ... influence / regulate the whole business life
- ... not only limited to water and waste water management

Main questions concerning the use of PIs:
- For which purpose?
- Who creates the PI System?
  - Utility itself
  - User [e.g. via „user associations“]
  - Authority/Regulator
PI System

PIs

Water Resources

Personnel

Technical Asset

Finance

Quality of Service

Operation

PIs
IWA offers in the PI handbooks a large number (approx. 150) of different PIs.

Any PI System must be „tailor-made“ with regard to location, social circumstances, size, economy to the questions to be answered to the problems to be solved.

Always: selection of a “small” number of appropriate PIs (approx. 10 – 25 PIs) is recommended.

Note: “Data Collection” alone is not a “PI System”!
# PI System for Wastewater Services

Table 1. Structure of the performance indicator framework

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>En</td>
<td>Environmental indicators</td>
</tr>
<tr>
<td>Pe</td>
<td>Personnel indicators</td>
</tr>
<tr>
<td>Ph</td>
<td>Physical indicators</td>
</tr>
<tr>
<td>Op</td>
<td>Operational indicators</td>
</tr>
<tr>
<td>QS</td>
<td>Quality of service indicators</td>
</tr>
<tr>
<td>Fi</td>
<td>Economical and financial indicators</td>
</tr>
</tbody>
</table>

Source: IWA Handbook. PIs for Wastewater
### Quality Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>wQS3</td>
<td>Treated Wastewater</td>
<td>Volume of wastewater treated in WWTP / collected sewerage x 100</td>
</tr>
<tr>
<td>wQS7</td>
<td>Tertiary Treatment</td>
<td>Volume of wastewater receiving tertiary treatment / collected sewerage x 100</td>
</tr>
<tr>
<td>wQS14</td>
<td>Interruption of WW collection and transportation services</td>
<td>SUM [Number of properties affected by discontinuities/interruptions x duration of interruptions in hours / (connected properties x 365 x 24) x 100]</td>
</tr>
</tbody>
</table>
## Operational Indicators

<table>
<thead>
<tr>
<th>wOp1</th>
<th>Sewer Cleaning</th>
<th>Length of sewers cleaned / total sewer length * 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Note:</strong> Actions under proactive management strategy</td>
<td>(not curative cleaning due to blockages!)</td>
</tr>
<tr>
<td>wOp20</td>
<td>Sewer Rehabilitation</td>
<td>Length of sewers rehabilitated / total sewer length * 100</td>
</tr>
</tbody>
</table>

Source: IWA Handbook. PI’s for Wastewater
### Operational Indicators

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Formula and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>wOp28</td>
<td><strong>Inflow</strong></td>
<td>Volume of water entering sewers (from groundwater and wrong connections) less the</td>
</tr>
<tr>
<td></td>
<td><strong>Infiltration</strong></td>
<td>leakage from sewers into ground / (collected sewage + inflow + infiltration –</td>
</tr>
<tr>
<td></td>
<td><strong>Exfiltration</strong></td>
<td>exfiltration) x 100</td>
</tr>
<tr>
<td>wOp32</td>
<td><strong>Blockages</strong></td>
<td>Number of blockages / total sewer length</td>
</tr>
</tbody>
</table>

*Note: blockages in service connections only included where these are the responsibility of wastewater utility*

Source: IWA Handbook. PI's for Wastewater
### Operational Indicators

<table>
<thead>
<tr>
<th>wOp34</th>
<th>Flooding from Sanitary Sewers</th>
<th>No. of flooding incidents related to sanitary sewers / total sewer length x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Note:</strong> Only include incidents to sewers under responsibility of the utility</td>
<td></td>
</tr>
<tr>
<td>wOp36</td>
<td>Sewer Collapses</td>
<td>Number of sewer collapses / total sewer length x 100</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> does not include collapses on service connections</td>
<td></td>
</tr>
</tbody>
</table>

Source: IWA Handbook. PIs for Wastewater
Only based on **PERFORMANCE INDICATORS**, it is feasible to “measure”/”assess”/”execute”

- Self-Assessment of Utilities
- Strategic Asset Management
- Metric and Process Benchmarking
Findings and Shortcomings

Also financing Institutes/Institutions/Donors

e.g. Ministries,
Development Agencies,
Worldbank,
EBRD

should base all Funding-/ Loan-/ Donor-
Contracts

on PERFORMANCE INDICATORS!
WWTP of the City of Vienna

4.000.000 PE

BSB5  15 mg/l
CSB    75 mg/l
TOC    25 mg/l
NH4-N  5 mg/l

For further questions:
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