Aligning Asset Management Strategy with Service Level Objectives

The successful outcome of an asset management program is the achievement of targeted service levels at the least cost and risk to the utility. Service levels play a key role in asset management strategy. They serve as a guiding force for making infrastructure investments and provide a basis for measuring success.

Asset Management Defined

In its simplest form, asset management is defined as:

_A business discipline for managing the lifecycle of infrastructure assets to achieve a defined level of service at the least cost and risk to the utility._

Key components of this definition are:

- **Lifecycle.** The lifecycle of an asset begins with planning and design and continues through procurement, adoption, operations, maintenance, rehabilitation/renewal, and replacement/disposal. Asset management seeks to minimize costs through each stage of this lifecycle while meeting established service level targets and mitigating risk.

- **Level of Service.** Service levels are a utility’s stated commitment to deliver service at a specified level of quality and reliability. Service levels can be performance-related (asset performance driven by faults, equipment failures, etc.) or customer/regulatory-related (response times, complaints, information availability, etc.). While service levels are sometimes mandated by a regulator, they are most often selected by the utility based on customer demands and business drivers and constraints.

- **Cost.** Asset management seeks to minimize social costs and image costs in addition to economic, or dollar, costs. That is to say that asset management is concerned with minimizing negative impacts to public health and safety and the utility’s image in addition to minimizing the financial costs associating with managing infrastructure.

- **Risk.** Mitigating the risks associated with unplanned events and critical asset failures is a primary component of asset management. The utility’s service level targets must be balanced with the level of risk exposure it is willing to take and budgetary constraints. For example, a utility may choose to focus preventive maintenance efforts on critical assets that have a high consequence of failure while letting non-critical assets that have nominal consequences run to failure.

Establishing Service Level Objectives

The first step in implementing an asset management strategy is to translate the utility’s business objectives and customer demands into service level targets. There are four basics categories of service levels:

- **Reliability-based** service levels relate to providing continuous, uninterrupted service to customers. Examples include targets and limits for unplanned events, crew dispatching, and outage duration.
• **Quality-related** service levels state the utility’s commitment to deliver clean, contaminant-free water. Examples include limits and targets for water odor, taste, color, and pressure.

• **Customer-related** service levels state the utility’s commitment to respond to customer needs and inquiries in a courteous and timely manner. Examples include standards and targets for complaint handling, new service connections, and call center wait times.

• **Regulatory-related** service levels are reliability and quality targets mandated by regulators and legislators. Examples include fireflow test requirements; EPA standards for residual chlorine; and consent decree compliance.

The actual service levels a utility selects should reflect its vision and goals in addition to:

• Customer expectations and the price customers are willing to pay
• Legislative requirements and environmental standards
• Availability of resources and financial constraints
• The utility’s asset and business capabilities or service delivery mechanisms.

Before establishing target services levels, current levels should be assessed. Determining the current level of service and comparing it to the level customers want enables gaps to be quantified and strategies to be developed to close those gaps. To assess existing service levels, a utility needs to measure how well it is delivering service to its customers in terms of water quality, customer service, response times, etc. A comprehensive analysis should be conducted with quantifiable performance measures to determine in what areas the utility is performing well and where it needs to improve.

**Getting Customers Involved**

In order to establish achievable, affordable service levels, it is important to understand what customers value and involve them early in the process. Customers should be aware of the utility’s mission and vision during the process so they can understand the utility’s goals and strategy. Customers can be involved in a variety of ways such as surveys, focus groups, advertisements, community forums, public meetings or community advisory boards. Ask customers what is important to them. Find out what they value. Then, find out how much they are willing to pay for a particular level of service. Most customers value reliability, time saving measures, and simple processes. They want their water to be safe to drink, available at all times, and they want to be able to pay their bill and resolve questions quickly and easily.

<table>
<thead>
<tr>
<th>Customers can easily tell you</th>
<th>Customer cannot easily tell you</th>
</tr>
</thead>
<tbody>
<tr>
<td>How they use your service</td>
<td>How to make it more useful</td>
</tr>
<tr>
<td>What they like and dislike</td>
<td>How to make it better</td>
</tr>
<tr>
<td>What their problems are</td>
<td>How to solve the problems</td>
</tr>
<tr>
<td>How much they like or use a new service</td>
<td>Whether or not a new service is something they would like or use</td>
</tr>
<tr>
<td>Which aspects of your service are more or less important than the others</td>
<td>How important a particular aspect is</td>
</tr>
</tbody>
</table>

**Source:** *Creating Customer Value from Community Assets Manual, Edition 1.0*
Often, the level of service demanded by customers does not match the cost to provide that level of service and rate negotiations will need to occur. The utility can offer the community several options. For example, the utility can say that it can provide water supply to a residential customer for $1.40 per day with an estimated two to three unplanned outages per year of less than four hours each. To provide a higher level of service of only one unplanned outage per year will cost 20 cents more each day. The customer then has a choice – to pay the higher rate for the higher level of service or not. Opening communications with customers in this way leads to improved relationships and better public perception of the utility. Once the customers understand the needed tradeoffs, they are more willing to agree to reasonable and achievable levels of service. If the customer feedback has set the utility in a new direction, the overall strategy may need to be adjusted.

**Aligning Asset Investments with Service Level Targets**

Arriving at the combination of investments that achieves established service levels at the least cost and risk to the utility requires a meticulous evaluation of the trade-offs associated with multiple possible scenarios. The utility must decide whether to achieve its service levels through asset capabilities or through business capabilities. It also must under the costs associated with each potential solution.

**Asset Capabilities vs. Business Capabilities**

A utility has two choices for responding to every service level target – it can respond in terms of asset capabilities or business capabilities. It can choose to add, renew, replace, or maintain its physical asset infrastructure to achieve the target or it can employ specific business practices to achieve the target. For example, if sediment from aging pipes is causing blockages and sanitary sewer overflows (SSOs), a utility can choose to either replace the pipes (an asset capability) or it can implement a program of sewer flushing and cleaning to avoid the problem in the first place (a business capability). The utility must decide if it is cheaper to achieve its service levels related to SSOs by avoiding SSOs altogether or by resolving them once they happen.

**Understanding and Balancing Costs**

Equally as complicated as understanding how to achieve a service level is understanding the costs associated with achieving a service level. There are three major categories of cost that come into play when responding to service levels—capital costs, operations and maintenance costs, and risk costs. The utility must evaluate the cost trade-offs associated with achieving its service levels. A business response may raise risk to an unacceptable level. Increasing O&M costs for a particular asset group may help the utility avoid an even larger capital cost.

A utility must evaluate the best way to operate, maintain, or renew/replace specific groups of assets to allow it to continue to provide the targeted level of service at the lowest possible cost. All spending must be justified in terms of providing a targeted level of service. If an activity or investment does not contribute to achieving service levels, then a utility should not spend time, effort, or resources on it. All utility efforts should be strictly focused on achieving service levels.

Understanding how to best achieve a service level target requires a deep understanding of each asset’s condition, probability of failure, and consequence of failure stated in terms of cost. It is about understanding where an asset is in its lifecycle and when it makes the most economic sense to replace it. Newly installed assets have very low incidence of failure, but as those assets age, so do their incidence of failure. The utility must decide if it is cheaper to continue to pay for
repairs or if it is cheaper to replace the asset. If the consequence, or cost, of the asset failure is low, the utility may decide to let it run to failure before replacing it. If the cost of failure is high, the utility may choose to discontinue repairs and replace the asset before it catastrophically fails. The trick is to find the balance that results in the least cost.

**Measuring and Improving Performance**

Continuously measuring and improving performance is a key element of asset management. Setting service levels is not enough—regularly monitoring those service levels is also necessary to ensure the utility is on track in achieving its goals. Each service level target defined by the utility should be translated to a set of performance measures and be monitored on a regular basis.

Performance measures assess the degree to which the utility is achieving its service levels as well as assessing the cost and risk exposure associated with achieving service levels. For example, a service level may be to respond to unplanned system outages within 30 minutes. Measuring performance against that service level might include calculating average response times, evaluating labor and transportation costs associated with the response time, and the risk exposure associated with diverting resources away from other activities to respond to the outage.

Because the goal of asset management is to achieve service level targets at the least cost and risk, it is not enough just to measure whether a service level has been achieved. By measuring the cost and risk of achieving the service level, the utility can continuously improve the way it goes about achieving its service level goals. It may find, for example, that cross-training operations and maintenance staff to provide the first line of response for unplanned outages may be a cheaper way of minimizing response times than re-configuring crew territories or increasing the number of crews in a territory.

**Conclusion**

Aligning asset management strategy with service level objectives is key to success. As achieving service level objectives is the end goal of a successful asset management program, it is important that all utility activities and investments track back to achieving those objectives. While it is not easy to precisely predict the level of service that is practical and affordable for the utility to achieve, it is important to start somewhere by choosing an initial target. Evaluating performance on a regular basis will enable the utility to continuously improve the way it achieves its service level targets.

**{SIDEBAR}**

**Developing Service Level Targets for Brunei Department of Water Services**

The country of Brunei is located in the China Sea on the island of Borneo. It is a country of approximately 330,000 people with a progressive government focused on improving the prosperity of its people and environment. The Brunei Department of Water Services (DWS) provides potable water to approximately 65,000 properties. DWS is in the process of implementing a long-term asset management strategy that improves its maintenance practices and raises service levels.
DWS’ business goals provided context for defining its service level targets and asset management strategy. DWS’ vision is to be recognized as one of the best water authorities in the region in terms of water supply, water quality, customer billing, and customer service. DWS also wishes to decrease the rate of unaccounted for water. Its mission is to provide clean, safe, affordable, and continuous water supply to their customers. Goals included increasing revenue collection to reduce unaccounted for water by 5% annually; and to provide continuous potable water supply for present and future needs.

Using its vision, mission, and business goals as a foundation, DWS conducted a series of workshops to establish its service level targets. After group discussions and brainstorming sessions, five categories of service levels were defined. Twenty specific service levels were identified and placed into the five categories. Next, performance measures were developed to specifically gage success. Relevant service level goals are published in a Customer Charter, which incorporates the DWS mission and vision, and is distributed to all customers.

Brunei Department of Water Services Example Service Level Targets

<table>
<thead>
<tr>
<th>Type*</th>
<th>Category</th>
<th>Service Level</th>
<th>From/To</th>
<th>Performance Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Water Quality</td>
<td>Water supplied to customer will pose no health risk</td>
<td>DWS to Customer</td>
<td>Number of parameters where result fails to comply with WHO Contaminate Levels (1993) equals zero</td>
</tr>
<tr>
<td>Primary</td>
<td>Customer Service</td>
<td>Respond to continuity of supply complaint within 4 hours</td>
<td>DWS to Customer</td>
<td>Number of pressure complaints validated as outside the acceptable range is less than or equal to three per month)</td>
</tr>
<tr>
<td>Primary</td>
<td>Reliability</td>
<td>No interruption will exceed 6 hours (planned or unplanned)</td>
<td>DWS to Customer</td>
<td>Number of events where the duration from first notification of interruption to resumption of service exceeds 6 hours equals zero</td>
</tr>
<tr>
<td>Primary</td>
<td>Reliability</td>
<td>No customer will experience more than 5 unplanned interruptions in a year</td>
<td>DWS to Customer</td>
<td>Number of times that more than 5 pipe failures occur or supply is isolated to any customer or group of customers equals zero</td>
</tr>
<tr>
<td>Suplemental</td>
<td>Supply of Stores</td>
<td>No interruptions to customer continuity of supply resulting from failure of Production at Water Treatment Works</td>
<td>Production to Supply</td>
<td>Number of events where complaints are received due to loss of water supply in any zone equals zero</td>
</tr>
<tr>
<td>Suplemental</td>
<td>Financial Performance</td>
<td>Each department will operate within 10% of budget</td>
<td>Departments to Director</td>
<td>Difference between planned budget and actual budget does not exceed 10% in any department</td>
</tr>
<tr>
<td>Suplemental</td>
<td>Supply of Stores</td>
<td>Supply Orders will be placed with vendors within 2 days after request is received</td>
<td>Stores to Departments</td>
<td>Number of events where authorized orders are not processed within time specified equals zero</td>
</tr>
</tbody>
</table>

*Primary service levels directly impact DWS customers. Supplemental service levels are internal targets that indirectly impact service to DWS customers.