Outcomes-based Value Framework

Case Study of Value Framework for Al Mafraq STP Pumping Station Physical Infrastructure Assets for ADSSC in Abu Dhabi.

Assets: Al Mafraq STP (Sewage Treatment Plant) Pumping Station owned by ADSSC (Abu Dhabi Sewerage Services Company).

The plant consists of 20 STPs, 260 Pumping Stations (SP) in operation, and approximately 12,606 km length of wastewater treatment networks located in Abu Dhabi Western Region.

The Value Framework is essential for aligning stakeholder expectations and ensuring that asset management decisions reflect the broad range of impacts these assets have on the organization, community, and environment. This framework helps prioritize critical asset management activities, determine risk levels, guide decision-making, and ensure the sustainability of the assets.

This framework includes multiple dimensions of value based on the 6 Capitals framework, incorporating financial, environmental, social, customer satisfaction, and reputational considerations, among others.

VALUE FRAMEWORK DIMENSIONS

FINANCIAL VALUE:

Objective: Optimize life-cycle cost, asset utilization, and operational efficiency.

Criteria:

- **High:** Significant cost savings through energy efficiency, low maintenance costs, or reduced downtime.
- **Medium:** Moderate improvements in efficiency with some cost savings.
- **Low:** High operational or maintenance costs with minimal savings.

Metrics:

I. Cost-Benefit Analysis (CBA).
II. Return on Investment (ROI).
III. Total Cost of Ownership (TCO).
IV. Operational Cost Savings (e.g., energy savings).

HEALTH AND SAFETY IMPACT

Objective: Ensure the safety of operations and protect the health of employees, contractors, and the surrounding community.

Criteria:

- **High:** Risk of injury is minimized through robust safety systems, with no history of accidents or incidents.
- **Medium:** Risk exists but is managed with ongoing mitigation strategies and safety training.
- **Low:** High safety risk due to ageing equipment or lack of safety systems in place.

Metrics:

I. Safety Incident Frequency Rate (SIFR).
II. Safety Compliance Audit Scores.
III. Hazard Identification and Mitigation Plans.

ENVIRONMENTAL IMPACT

Objective: Minimize the environmental footprint of the pumping station and contribute to sustainability goals.

Criteria:

- **High:** Significant reduction in emissions, energy consumption, or water usage. Compliance with stringent environmental regulations.
- **Medium:** Moderate environmental impact with potential for improvement through new technologies or strategies.
- **Low:** High environmental impact with little mitigation, non-compliance risks.

Metrics:

I. Greenhouse Gas Emissions (GHG) Reduction.
II. Water Treatment Efficiency.
III. Compliance with Environmental Regulations and Standards (e.g., ISO 14001).
IV. Waste Reduction Measures.

REPUTATION VALUE

Objective: Enhance the reputation of ADSSC and build trust with stakeholders, including regulatory authorities, the public, and investors.

Criteria:

- **High:** Strong positive reputation due to effective asset management, customer satisfaction, and compliance with regulations.
- **Medium:** Moderate reputation impact with areas for improvement in communication and transparency.
- **Low:** Poor reputation due to asset failures, safety issues, or environmental violations.

Metrics:

I. Stakeholder Satisfaction Surveys.
II. Public Perception and Media Coverage.
III. Regulatory Compliance Record.
IV. Crisis Management and Response Times.

CUSTOMER SATISFACTION

Objective: *Ensure that customer needs are met by providing reliable service while minimizing disruptions to the public.*

Criteria:

- **High:** High level of customer satisfaction with reliable service delivery and minimal disruptions.
- **Medium:** Satisfactory customer service, but with occasional service interruptions or issues.
- **Low:** Frequent service disruptions, causing dissatisfaction and complaints.

Metrics:

I. Customer Satisfaction Scores (CSAT).
II. Frequency and Duration of Service Interruptions.
III. Customer Complaints and Resolution Time.

SOCIAL VALUE

Objective: Contribute positively to the local community and support social development objectives.

Criteria:

- **High:** Significant community engagement, job creation, and support for local social programs.
- **Medium:** Moderate community engagement with potential for further development.
- **Low:** Minimal or no social value generation.

Metrics:

I. Number of Local Jobs Created.
II. Community Engagement Activities.
III. Corporate Social Responsibility (CSR) Initiatives.

IMPLEMENTATION OF THE VALUE FRAMEWORK

To implement the value framework for Al Mafraq STP Pumping Station, ADSSC followed these steps:

STAKEHOLDER ENGAGEMENT

- Conduct workshops with internal and external stakeholders to define and agree on value criteria and metrics.
- Identify key stakeholders, such as local government, regulatory bodies, residents, and employees.

DATA COLLECTION

- Develop a robust data collection system for each value dimension.
- Use IoT sensors and monitoring systems for real-time data on energy use, emissions, and operational performance.

SCORING AND EVALUATION

- Create a scoring system to evaluate each asset's performance across the value dimensions (e.g., high, medium, low).
- Develop decision matrices or weighted scoring systems to quantify impacts and trade-offs across various value dimensions.

INTEGRATION WITH ASSET MANAGEMENT SYSTEMS

- Integrate the Value Framework into ADSSC's existing Asset Management System (AMS).
- Use the framework in conjunction with tools like Asset Criticality and Risk Assessment Models to make informed decisions.

PERFORMANCE MONITORING AND CONTINUOUS IMPROVEMENT

- Continuously monitor asset performance against the defined value dimensions.
- Use the data to drive improvements and realign priorities as needed.

EXAMPLE: APPLYING THE VALUE FRAMEWORK TO A KEY ASSET

Let's consider the Pumping Station Power Supply System as a key asset:

FINANCIAL VALUE:

High impact: If the power system is upgraded with energy-efficient components, it can reduce energy consumption by 20%, lowering costs.

HEALTH AND SAFETY:

Medium impact: The system has safety features in place but is ageing, requiring regular inspections to mitigate risks.

ENVIRONMENTAL IMPACT:

High impact: Upgrading to renewable energy sources or improving energy efficiency could significantly reduce the carbon footprint.

REPUTATION:

High impact: The upgrade would enhance ADSSC's reputation as a leader in sustainability and innovation.

CUSTOMER SATISFACTION:

Medium impact: Customers may experience short-term disruptions during upgrades but will benefit from increased reliability afterwards.

SOCIAL VALUE:

Medium impact: The project could provide local employment opportunities and improve infrastructure for the surrounding community.

CONCLUSION

The Value Framework for Al Mafraq STP Pumping Station ensures that asset management decisions are made with a holistic view of financial, environmental, social, and reputational impacts. It helps prioritize investments, identify risks, and make decisions that benefit both ADSSC and the wider community. The framework also guides trade-offs, ensuring that no dimension of value is overlooked in the decision-making process. By continuously applying this framework, ADSSC can enhance the long-term sustainability, performance, and value derived from its assets.

This case study was kindly submitted by Eng. Galal A.Yousf, UAE.