Examples of Asset Management Good Practice

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20th Century Hydropower Plant Management approach:

“If it ain’t broke, don’t fix it”.

- Maintenance, repairs and replacements focused on direct issues, rather than effects on related equipment
- Hydroplants required near continuous repair to one piece of equipment or another.
- Cumulative costs of repairs could exceed the value of the powerplant over a shortened time frame.

By the mid 1990’s hydroplant management began to move to an asset and risk management approach.
Drivers for Change:

- As fleets of existing hydro plants aged, former management approach became increasingly inflexible and untenable.
- Traditional managers retired and were succeeded by staff with experience and focus on business.
- External communication and networking showed use and benefits of asset management for infrastructure and industry.
- Increasing need to meet statutory obligations drove the adoption of risk-based processes to assess threats to the business.
- Privatization and electricity market deregulated increased the focus on performance and value.
- Boards became responsible for, asset and risk based decisions.
AM Components and Scope
Asset Management (AM) Good Practice.

A systematic approach based on considering an individual or fleet of hydro plants from a holistic perspective, with management decisions based on:

- maximizing level of service (LOS),
- minimizing cost of service (COS),
- managing risk and
- meeting regulatory obligations,

with the overall purpose of meeting corporate objectives and maximizing asset value.
Asset Management Objectives

Maximise production opportunities

Optimal balance

Minimise whole of lifecycle costs

Reduce business risks
Key Elements of Asset Management include:

• Identifying issues and potential risks that could affect asset performance
• Assess the issues and risks in terms of their importance
• Identify appropriate treatments to manage the issues and risks
• Prioritize between options and alternatives
• Select the project and develop scope, cost and schedule
• Deliver the work plan and evaluate the outcomes
‘HOW’ we do it:
Asset Management Process

- Identify & Analyse Asset Issues & Risks
- Evaluate & Select Treatments
- Develop Project Scope
- Cost & Timing
- Maintenance Works Delivery
- Maintenance Project Delivery

- Plan
- Schedule
- Execute
- Close

- Monitor & Review
- Identify Issue
- Analyse
- Risk Assess
- Evaluate Treatments
- Preventive Maint.
- Corrective Maint.
- Spares & Contingency
- Operation & Constraints
- Policy, Standards, Plans
- Capital
- Scope
- Estimate
- Gate paper

- Data & Reports
- Events
Issues and Risks

• An Issue is "an event that has happened, is happening or is known to be going to happen"

• A Risk* is "an event that may or may not happen".

*Risks can relate to both the strategic and operational context and be internal or external to the organisation.
Issues and Risk Identification

- Identification of issues normally evolves from routine or corrective maintenance and regular condition and performance assessments.

- Risk Identification is the process to document any events that could occur and potentially compromise the capability, safety or performance of the hydroplant.
Monitor & Review

- Long term condition & performance trends
- Lifecycle position
- Evaluation of maintenance strategy and treatment plans

Identify Issue

Analyse

Risk Assess

Evaluate Treatments

Corrective Maint.

Preventive Maint.

Capital

Scope

Estimate

Gate paper

Plan

Schedule

Execute

Close

Identify & Analyse Asset Issues & Risks

Evaluate & Select Treatments

Develop Project Scope

Cost & Timing

Maintenance Works Delivery

Maintenance Project Delivery

- Data & Reports
- Monitor & Review
- Spares & Contingency
- Operation & Constraints
- Policy, Standards, Plans

- Events
- Annual workshops to review risks and issues
- Update of asset strategies

- Long term condition & performance trends
- Lifecycle position
- Evaluation of maintenance strategy and treatment plans

- Policy, Standards, Plans
- Capital
Issues and Risk Assessment - Two Approaches

Station Asset Management Plans cover all issues and risks identified at an individual hydro power station, their assessment, analysis and program of treatment. By understand all intervention that is needed to meet the overall strategic objectives of the station, a full plan of activities can be developed. This also enables the station (or asset) value to be established.

Asset-Type Management Plans cover approaches for individual or closely dependant assets, such as turbines and generators across multiple units or the fleet of hydro plants. These plans allow performance and condition comparisons across similar unit types in different hydro power plants. A program to replace Kaplan turbine units across multiple plants allowed a planned program for work crews, cost reductions based on unit volume and a reduction in spare part inventories.
IDENTIFY & ANALYSE ASSET ISSUES & RISKS

**Data & Reports**
- Asset Health & Performance
- Compliance review
- Condition monitoring
- Data analysis and trending

**Events**
- Breakdowns
- Alarms

**Identify**
**Analyse**
**Risk Assess**
**Evaluate Treatments**

**Corrective Maint.**
**Preventive Maint.**
**Capital**
**Spares & Contingency**
**Operation & Constraints**
**Policy, Standards, Plans**

**Identify & Analyse Asset Issues & Risks**

**Evaluate & Select Treatments**

**Develop Project Scope**
- Cost & Timing

**Maintenance Works Delivery**

**Plan**
**Schedule**
**Execute**
**Close**

**Monitor & Review**
Prioritization

The overall asset management approach is to meet corporate objectives and maximize asset value. However, with possible constraints (financial, work force etc.,) not all works can be undertaken immediately. Prioritization helps make good choices, which projects and what order!

- Meeting regulatory requirements (safety, due diligence). If not immediately possible, risk control measures should be considered.
- Addressing high ranking risks at the asset level.
- Selecting projects that maintain or enhance productivity from the most productive, and therefore valuable, hydro plants.
IDENTIFY & ANALYSE ASSET ISSUES & RISKS

DATA & REPORTS

IDENTIFY ISSUE

EVENTS

MONITOR & REVIEW

ANALYSE

RISK ASSESS

EVALUATE TREATMENTS

CORRECTIVE MAINT.

PREVENTIVE MAINT.

SPARES & CONTINGENCY

OPERATION & CONSTRAINTS

POLICY, STANDARDS, PLANS

CAPITAL

SCOPE

ESTIMATE

GATE PAPER

PLAN

SCHEDULE

EXECUTE

CLOSE

DEVELOP PROJECT SCOPE COST & TIMING

MAINTENANCE WORKS DELIVERY

MAINTENANCE PROJECT DELIVERY
Evaluation of Treatment Effectiveness

Water to Wire (W2W) Risk Map

Progress from 2008 to 2018
I hope you have enjoyed

Examples of Asset Management Good Practice

Thank You