Appendix 25

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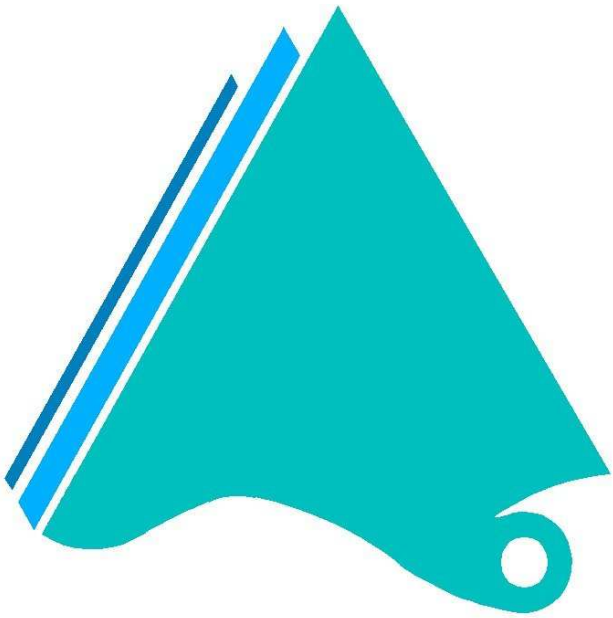
Review of Scheduled Preventative Maintenance
(Hunter Water Australia)



Review of Scheduled Preventative Maintenance

Gladstone Area Water Board

3 August 2009
Ref. No. 3071-003
Hunter Water Australia Pty Limited

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Gladstone Area Water Board

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3 August 2009

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Document History

Title Review of Scheduled Preventative Maintenance

Ref 3071-003

Date 3 August 2009

Prepared by Peter Buckland

Reviewed by Jim Keary

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
1	21/07/2009	First Draft	Jim Keary	JBK210709
2	3/08/2009	Final version	Jim Keary	JBK220709

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1.0 Introduction

This report describes the findings and observations of a review of the preventative maintenance schedules for the infrastructure assets of Gladstone Area Water Board (GAWB).

GAWB is undergoing a Pricing Reset exercise with the Queensland Competition Authority (QCA), and requires that it's proposed Preventative Maintenance schedules are reviewed by a third party to substantiate the appropriateness of the maintenance tasks. The review is to involve a sensibility check to verify the appropriateness of GAWB's preventative maintenance scheduled for infrastructure assets.

The review process involved GAWB supplying a spreadsheet entitled "Task By Activity" which is understood to comprise the input data to the GHD generated 20 year budget plan. Relevant experts from Hunter Water Australia did a sensibility check to assess the appropriateness and frequency of the tasks. The sensibility checks were a desktop exercise based on the spreadsheet information made available. The sensibility checks compared the type and frequency of the preventative task with what could be considered to be within the normal range of reasonable expectations for similar equipment and structures in the water industry throughout Australia.

The "Task By Activity" spreadsheet detailed the name of the various maintenance tasks, approximately 1500 in total, and the frequency of the task. It also gave the annual cost for each task for the next 5 years. Based on brief and information made available, the sensibility check by Hunter Water Australia was confined to the task periodicity or frequency, not the costing. It was based on the Task Name and Period, eg Reservoir Cleaning (1Year) or Sump Pump No1 service (1Month) and it required "industry knowledge" by the reviewers to provide the context in which such equipment is used by the industry, average conditions and generic maintenance requirements. This was in line with the spreadsheet information made available as to go beyond this would have required detailed knowledge on the size, function or condition of the assets.

The review is a critique that raises questions where necessary, highlights any anomalies and provides a judgement on the adequacy of the maintenance schedules. The review covers only scheduled maintenance and includes no consideration of reactive or breakdown maintenance, which in most of the water industry is a very significant component of the total maintenance cost.

The sensibility checks were undertaken by the following professional engineers from Hunter Water Australia who have considerable expertise in the designated areas:

Peter Buckland	Electrical/Mechanical/Operations/Control Systems
Matthew Dafter	Pipelines/Inspection(Cathodic Protection)
Jeremy Smith	Structural/Easements/Cleaning/ Buildings

2.0 Electrical/Mechanical Equipment

2.1 Scope of Activities Reviewed

This section of the report covers the scheduled maintenance for Electrical Services, Mechanical Services, Operations and Control Systems Services sections of the spreadsheet 'Task By Activity' provided by GAWB.

2.2 Findings

Electrical Services

The scheduled electrical maintenance outlined in the spreadsheet represents an appropriate approach in the circumstances to the scheduled maintenance of water industry electrical equipment. It is based on maintenance of classes of equipment, eg transformers, motors, circuit breakers etc, and applies the same strategy across the class. That is to say, the maintenance generally is independent of equipment size, its function or its condition, and assumes an average of these factors across the class.

It is considered the Electrical task frequencies outlined in the spreadsheet provided, in most instances, are not considered unusual for the classes of equipment represented.

Observation:
There are a number of Switchboard Service tasks which don't have a frequency allocated. Consistent with the approach, it would be reasonable to assume that these would be undertaken annually and these tasks need to be added to the schedules and cost estimates.

Mechanical Services

The scheduled mechanical maintenance outlined represents an appropriate approach in the circumstances and is also based on maintenance of classes of equipment, eg pumps or valves, applying the same strategy across the class. There are of course exceptions, eg the three main pumps at Awoonga, which are treated as a separate class.

Again, the mechanical task frequencies would in most instances not be considered unusual for the classes of equipment represented.

Observations:

1) The annual costs shown against the three main Awoonga pumps need further scrutiny as the frequency of the tasks have different frequencies.

2) The need for cleaning of reservoirs annually should be scrutinised and possibly reduced whilst allowing for some increased costs for regular inspections.

3) A check should be made on the servicing chlorinators yearly as this might need to be done more often eg six monthly.

Operations

These are all daily operational monitoring schedules.

Observations:

1) The current cost of $28,000 per annum for monitoring indicates that GAWB should consider the installation of telemetry at some future time to lower these costs.

2) The costing should be scrutinised for the daily monitoring of pumps 1, 2, and 3 stuffing boxes.

Control Systems Services

The control systems activity can be divided into 4 classes:- Flow meter checks, Pressure gauge check & clean, Miscellaneous instrument work, Service telemetry, with the first two accounting for about 85% of the annual cost.

We cannot comment on the Service telemetry activity as it is unscheduled and the costs should be allowed for elsewhere in the budget. The bulk of the remainder of the scheduled maintenance is at frequencies considered not unusual for this type of equipment.

Observation:

In future structuring of the budget, consideration might be given to placing the maintenance of Miscellaneous instruments and the daily pressure gauge check in with the operations function.

3.0 Pipelines/Inspections (cathodic protection)

3.1 Scope of Activities Reviewed

This section of the report covers the pipelines and inspections (cathodic protection) sections of the spreadsheet 'Task By Activity' provided by GAWB.

3.2 Findings

Pipelines

The pipeline structures scheduled maintenance can be broadly divided into two categories viz. pipelines and pipework & fittings. The GAWB schedule lists an annual surface inspection of all pipelines, pipework & fittings.

The annual maintenance survey of pipeline surfaces would not be considered unusual for these types of structures.

Observations:

1) The costing for the pipeline surfaces inspection should be reviewed. It would be highly unusual for the cost of an inspection on a large diameter trunkmain of any length to match the inspection costs associated with small diameter ancillary pipework.
2) It is assumed that both proactive and reactive maintenance of any serious issues arising during the inspections will be carried out by GAWB and there is adequate budget to cover such activities elsewhere in the budget.

Inspections (cathodic protection)

The scheduled maintenance task provided by GAWB represents a safe approach to cathodic protection maintenance.

It is not uncommon within the water industry for maintenance of cathodic protection on pipelines to be largely ignored. This is an unsafe practice, not economically sound in the long term and not recommended. The practice of having an annual survey of a sacrificial anode type cathodic protection system is good practice until better information is available and appropriate risk analysis is undertaken on each pipeline segment.

4.0 Structures/Easements/Cleaning/Buildings

4.1 Scope of Activities Reviewed

This section of the report covers the scheduled maintenance for Structures, Easements, Cleaning and Buildings sections of the spreadsheet 'Task By Activity' provided by GAWB.

4.2 Findings

Structures

The scheduled maintenance/inspections outlined in the spreadsheet represent an appropriate approach to the scheduled maintenance/inspections of water industry structures. It is based on inspection of Awoonga Dam, East End Reservoir and buildings and fixtures at Gladstone Water Treatment Plant. The GAWB schedule lists annual inspections of the bridge, intake tower and dam safety inspection at Awoonga Dam, the structure including roof and lifting beam at East End Reservoir and the building including lifting beam at Gladstone Water Treatment Plant.

It is considered the Structural inspections outlined in the spreadsheet provided are not considered unusual for the infrastructure represented. Following initial inspection, frequency could be reduced or increased on a case by case basis.

Observation:
The costing for the reservoir and water treatment plant should be reviewed as the inspection costs appear to be low.

Easements

The scheduled maintenance/inspections outlined in the spreadsheet represent an appropriate approach to the assets involved. They are based on inspection of access roads for pipelines, dams, reservoirs, pumping stations and treatment plants.

The annual inspections outlined in the spreadsheet provided are considered normal for the types of assets involved.

Observations:

The cost allocated for each easement inspections are equal except in the case for three inspections, where presumably these are significantly larger or more difficult easements to assess. These are the 1440mm diameter MSCL pipe and valve easement connecting Awoonga and Toolooa, the access road to East End Reservoir as well as the 300mm CICL pipeline between Tooloa Chlor and Golegumma.

Cleaning

The scheduled maintenance/inspections outlined in the spreadsheet represent an appropriate approach to the scheduled maintenance/inspections of water industry structures. It is based on maintenance of the clarifiers and channels at Yarwun Water Treatment Plant and the cleaning of two clarifiers at Gladstone Water Treatment Plant.

The annual maintenance outlined in the spreadsheet provided is considered in the normal range of expectations for the types of assets involved. The frequency might be able to be extended to 5 yearly after

a detailed risk assessment which would include factors such as raw water quality conditions and structural integrity.

Observations:

The task name (cleaning clarifier) does not reflect the item name (switchboard and telemetry). No frequency of inspections is nominated. It is suggested that annual inspections would be appropriate initially with the ability after feedback and further assessment to reduce or increase frequency on a case by case basis.

Building Services

The scheduled inspections outlined in the spreadsheet represent an appropriate approach to the scheduled inspections of water industry structures. It is based on inspection of fence lines, buildings, lights, equipment, easements and structures for pipelines, dams, reservoirs, pumping stations and treatment plants.

The annual inspections for the structures outlined in the spreadsheet provided are considered within the normal range of expectations in the circumstances. However consideration could be given following feedback from a series of inspections and risk assessments to reduce or increase the frequency on a case by case basis.

It is also considered that monthly inspection frequency on the pumps might be reviewed after a proper risk assessment involving criticality, age, functionality and condition of each asset with the possibility of extending the inspection frequency in future.

Observation:

Costs for each task are consistent throughout the maintenance schedule for all sites.

5.0 Conclusions

The overall conclusion from this review of the planned maintenance schedules is that in view of the circumstance of this being the first comprehensive planned maintenance program assembled for all major assets of GAWB, the frequency of maintenance tasks is at an appropriate and reasonable level for different types of equipment and structures based on the information made available.

A series of observations has been made where further scrutiny might lead to improvements and future risk assessments may lead to potential cost savings over time. Many of the observations for improvement and optimisation of planned maintenance will ultimately rely on GAWB having fully configured and implemented a computerised maintenance management system which would include such functionality as work orders, maintenance and failure history, planned maintenance schedules, standard operating procedures etc. It is understood that the current Dynamics (Navision) financial management system has capabilities but has yet to be implemented.

If improvement is to occur and future budgets are to have reduced costs for planned maintenance then it is important that the current budget has sufficient funds it to do the following:

- Fully configure and implement a computerised maintenance management system
- Employ a full-time maintenance scheduler
- Carry out risk assessments and optimise planned maintenance schedules