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Decision Making:

a special "how to" issue - a practical example, well explained, with many uses

We often find ourselves in the situation of having to make a decision where many factors are involved. In these circumstances it is is easy for different officers, and different experts who views are sought, to hold differing opinions based on the factor of most importance to them.

The problem is to make a decision that both minimises the downside consequences *and* gets agreement from all the players.

This was the problem facing the Townsville City Council's asset managers. The problem that they faced was a technical one. Should they treat their extensive pipe relining as a 'refurbishment' or as a 'new asset'.

Before you are tempted to say 'toss for it' it is worth reading the current issue where Vivek Kangesu, the Corporate Asset Manager and his Asset Strategic Officer, Heidi Carroll, show us how they used the Kepner-Tregoe Model to apply systematic thinking to this question - and ended up with a transparent model that educated everyone and secured their agreement.

You can apply this technique with equal success. It takes patience - but your patience will be rewarded.

Please consider - and enjoy!
Penny

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DECISION MAKING

1. Making decisions is easy.

2. Getting general agreement for those decisions is not so easy

3. Whilst minimising the downside effects of all the factors involved is the most difficult of all.

How can you do all three?

In this issue, Vivek Kangesu and Heidi Carroll demonstrate how they used the Kepner-Tregoe Model to decide whether they should treat their extensive pipe relining as a 'refurbishment' or a 'new asset'.

What is Kepner-Tregoe? Briefly, this is a model that:

1. Clarifies the situation, (enabling a wide range of views to be taken into account)

2. **Defines the problem** (what are the strategic "must haves", the operational "want to haves" and what are the restraints or limits in the system. These define the factors of importance to the decision.)

3. **Identifies alternatives** (eliminating those that do not meet the strategic "must haves")

4. **Analyses each alternative, and each factor** (the importance of each factor is weighted and the 'satisfaction score' - how well the alternative meets the need of each individual factor - is calculated.)

The scores are then totalled and compared for each of the alternatives considered.

5. **Implementation:** The Winning Option then has each of its negative consequences considered together with a plan to minimise the adverse effects.

Now read on to see it in action.....

Pipe Relining: Treat as Refurbishment or New Asset? Discussion Paper

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1. Purpose

This discussion paper addresses the current challenges Townsville City Council [TCC] faces in regards to Asset Management decisions and considering the accounting treatment of pipe relining.

2. Introduction

TCC currently reline pipes through various techniques, tailored to specific outcomes; dependant on the contractors' skills, materials suitable, cost, effectiveness, levels of disturbance, and environmental/governance requirements.

There are two principle differences between relining methods;

i) *Structural*

a) New pipe is concrete-lined into the host pipe; utilising the strength from concrete-lining greatly improves structural strength and economic life, whilst reducing capacity of the original pipe.
b) Pipe bursting replaces host pipe simultaneously with new pipe; new economic life, new material but the capacity is not reduced.

ii) *Treatment*

Relining host pipe with PVC; improves the economic life, utilising residual structural strength from the host pipe, and capacity is reduced but insignificantly. Currently there is no objective measure in decision-making between the two principles of repair within TCC.

Along with these alternative methods, come alternative accounting treatments:

i) *Create a new asset*

Write-off the host pipe, transferring the residual value along with the actual cost to a new asset number, recognising the new economic life.

ii) Treat as existing asset (refurbish)

Recognise the reline as an enhancement/ rehabilitation of the existing asset, adding the reline actual cost to the fair value of the asset and extend the economic life.

Currently, TCC account for relining via the first method; by creating a new asset but not considering the residual value of the parent pipe.

3. Analysis and Process

Kepner-Tregoe Analysis [KT Analysis] is useful for making and recording decisions where there are *multiple* factors to consider within a problem. This paper introduced earlier that the relining issue entails several branches of a decision path; therefore KT Analysis is a suitable choice of tool to highlight root causes and aid in decision making. In order to perform the analysis, the following steps were performed:

a). Factors (key objectives in decision making):
Seven factors that are important in making decisions regarding the accounting treatment, recording of data, and choice of technique were developed through consultation with national experts.

Factor 1: Lifecycle cost

i) Ease of deciphering costs between both methods of reline (Parent material and Relining material).
ii) Ease of retaining the history of the old asset prior to relining to create life cycle analysis for old and relined pipes.

Factor 2: Quality

Quality of data maintained in order to assess the asset cost, residual value of the parent asset, relining cost, , economic life. (The more manual interpretation required from the system, the greater inefficiency in time/resources).

Factor 3: Time

i) Ease of asset creation/assigning asset.

ii) Ease of managing changes to the Asset in Fixed Asset register(FA), Equipment Register(ER) and GIS (lifetime of asset will increase once it is relined, therefore recognition of change must reflect in FA, ER & GIS)

iii) Timeliness of project requirement.

Factor 4: Experience

i) Experience of treating various relining techniques - standard relining, structural relining, pipe bursting, or other.

ii) Details/evidence of the expected life that can be received from the reline.

Factor 5: Asset Accounting treatment

Ease of accurate revaluation, economic life, depreciation, unit rate assessment of parent pipe, competency in recording actual costs.

Factor 6: System

Investigate the system process to transfer the residual value from the old asset to the new relined asset. (Once again, manual process leads to time / cost).

Factor 7: Best Practice

Assess which practice (structural reline, pipe bursting or other future no dig technologies) are the most appropriate/efficient/effective practices as technologies change.

b). Weighting:

Once the factors had been determined, the two methods were identified; “standard relining treatment to the existing asset” and “standard relining treatment of a new asset”. Corporate asset management assigned a weighting to each factor for both alternative methods through consultations with national asset management experts; 1 for low importance 10 for great importance.

Table 1 shows the weighting of the factors.

c). Rating:

As with the weighting, both alternative methods of accounting treatment receive a rating of importance also. Corporate asset management assigned the ratings for both alternative methods through consultations with national asset management experts

The table 2 shows the rating of the factors for the alternatives.

Table 1.

Item	Factor (Important objectives for the decision making)	Weighting (low imp. 1 - high imp. 10)
1	Lifecycle cost: 1. Ease of deciphering costs between both methods of reline (Parent material and Relining material). 2. Ease of retaining the history of the old asset prior to relining to create LC analysis for old and relined pipes.	8
2	Quality - Quality of data maintained in order to assess the asset cost, residual value of the old asset, relining cost, DPIA, economic life. (The more manual interpretation required from the system, the greater inefficiency in time/resources).	8
3	Time: 1. Ease of asset creation/assigning asset. 2. Ease of managing changes to the Asset in FA, ER and GIS (lifetime of asset will increase once it is relined, therefore recognition of change must reflect in FA, ER & GIS). 3. Timeliness of project requirement.	6
4	Experience: 1. Experience of treating various relining techniques - standard relining, structural relining, pipe bursting, other 2. Details/evidence of the expected life that can be received from the reline.	5
5	Asset Accounting treatment: Ease of accurate revaluation, economic life, depreciation, unit rate assessment of old pipe, competency in recording actual costs.	7
6	System: Investigate the system process to transfer the residual value from the old asset to the new relined asset. (Once again, manual process leads to time / cost).	9
7	Best Practice: Asses which practice (structural reline, pipe bursting or other future no dig technologies) is the most appropriate/efficient/effective practice as technology changes.	9

Factor (Important objectives for the decision making)	Alternative a) Standard relining as a treatment to the existing asset (rate low 1 to high 10)	Alternative b) Treat the standard relined as New asset (rate low 1 to high 10)
Lifecycle cost: 1. Ease of deciphering costs between both methods of reline (Parent material and Relining material). 2. Ease of retaining the history of the old asset prior to relining to create LC analysis for old and relined pipes.	5	8
Quality - Quality of data maintained in order to assess the asset cost, residual value of the old asset, relining cost, DPIA, economic life. (The more manual interpretation required from the system, the greater inefficiency in time/resources).	7	6
Time: 1. Ease of asset creation/assigning asset. 2. Ease of managing changes to the Asset in FA, ER and GIS (lifetime of asset will increase once it is relined, therefore recognition of change must reflect in FA, ER & GIS). 3. Timeliness of project requirement.	8	6
Experience: 1. Experience of treating various relining techniques - standard relining, structural relining, pipe bursting, other 2. Details/evidence of the expected life that can be received from the reline.	7	7
Asset Accounting treatment: Ease of accurate revaluation, economic life, depreciation, unit rate assessment of old pipe, competency in recording actual costs.	6	8
System: Investigate the system process to transfer the residual value from the old asset to the new relined asset. (Once again, manual process leads to time / cost).	7	6
Best Practice: Asses which practice (structural reline, pipe bursting or other future no dig technologies) is the most appropriate/efficient/effective practice as technology changes.	5	8

Table 2.
(Satisfaction scores for each alternative against each factor)

d). Analysis:
The weighting and rating of each factor is considered and allocated a formulated score to objectively rank both alternatives and offer a decision of which option is the better alternative, based on the factors that the Group have highlighted as most important in considering the decision. (Refer Table 3 – 5)

4. Analysis

The results take into account the objectively weighted and ranked factors (as per Tables 1 & 2) and produce scores for both the alternative choices:

a) Treat the standard relining as a treatment of an "existing asset" or

b) Treat the standard relining as a "new" asset

Multiplying factor importance by Level of Satisfaction in meeting that factor
Table 3

Results: Alternative A - Standard relining as a treatment to the existing asset

Item	Factor (Important objectives for the decision making)	Weighting (low imp. 1 - high imp. 10)	Rating (low imp. 1 - high imp. 10)	Score
1	Lifecycle cost: 1. Ease of deciphering costs between both methods of reline (Parent material and Relining material). 2. Ease of retaining the history of the old asset prior to relining to create LC analysis for old and relined pipes.	8	5	40
2	Quality - Quality of data maintained in order to assess the asset cost, residual value of the old asset, relining cost, DPIA, economic life. (The more manual interpretation required from the system, the greater inefficiency in time/resources).	8	7	56
3	Time: 1. Ease of asset creation/assigning asset. 2. Ease of managing changes to the Asset in FA, ER and GIS (lifetime of asset will increase once it is relined, therefore recognition of change must reflect in FA, ER & GIS). 3. Timeliness of project requirement.	6	8	48
4	Experience: 1. Experience of treating various relining techniques - standard relining, structural relining, pipe bursting, other 2. Details/evidence of the expected life that can be received from the reline.	5	7	35
5	Asset Accounting treatment: Ease of accurate revaluation, economic life, depreciation, unit rate assessment of old pipe, competency in recording actual costs.	7	6	42
6	System: Investigate the system process to transfer the residual value from the old asset to the new relined asset. (Once again, manual process leads to time / cost).	9	7	63
7	Best Practice: Asses which practice (structural reline, pipe bursting or other future no dig technologies) is the most appropriate/efficient/effective practice as technology changes.	9	5	45

TOTAL SCORE 329

Table 4

Results: Alternative B - Treat the standard reline as a new asset

Item	Factor (Important objectives for the decision making)	Weighting (low imp. 1 - high imp. 10)	Rating (low imp. 1 - high imp. 10)	Score
1	Lifecycle cost: 1. Ease of deciphering costs between both methods of reline (Parent material and Relining material). 2. Ease of retaining the history of the old asset prior to relining to create LC analysis for old and relined pipes.	8	8	64
2	Quality - Quality of data maintained in order to assess the asset cost, residual value of the old asset, relining cost, DPIA, economic life. (The more manual interpretation required from the system, the greater inefficiency in time/resources).	8	6	48
3	Time: 1. Ease of asset creation/assigning asset. 2. Ease of managing changes to the Asset in FA, ER and GIS (lifetime of asset will increase once it is relined, therefore recognition of change must reflect in FA, ER & GIS). 3. Timeliness of project requirement.	6	6	36
4	Experience: 1. Experience of treating various relining techniques - standard relining, structural relining, pipe bursting, other 2. Details/evidence of the expected life that can be received from the reline.	5	7	35
5	Asset Accounting treatment: Ease of accurate revaluation, economic life, depreciation, unit rate assessment of old pipe, competency in recording actual costs.	7	8	56
6	System: Investigate the system process to transfer the residual value from the old asset to the new relined asset. (Once again, manual process leads to time / cost).	9	6	54
7	Best Practice: Asses which practice (structural reline, pipe bursting or other future no dig technologies) is the most appropriate/efficient/effective practice as technology changes.	9	8	72

TOTAL SCORE 365

Table 5

Decision Making:

Item	Alternative	Total Score
a)	Standard relining as a treatment to the "existing asset"	329
b)	Treat the standard relined as "New" asset	365

Recommended Decision:
Treat the standard relined as "New" asset

Recommendations from External Asset Managers:
Treat as "New" asset

Note Alternative B, treat the relining as a new asset, received a greater score due to higher ratings against those factors declared with greater weighting/importance opposed to the alternative treatment. Whichever alternative receives the highest score (in this case Alternative B) is further highlighted as the best practice in Table 5.

Table 5 also depicts the consensus opinion of external asset managers, which is to treat as a new asset.

5. Future trend

As technology evolves effective relining methods will continually be sought; those offering minimal disturbance, increased focus on environmental impact, cost effective, and those which meet political acceptance with a perception of “value for money” for the public, will be ideal techniques. With the evolution of new technologies, comes the task of assessing decision outcomes surrounding the technique and accounting method chosen. Therefore, it is imperative for a decision-model to exist, aiding objective assessments in the future.

6. Conclusion

The KT Analysis is a valid tool for analysis where there are several branches within a decision path, such as choosing a relining method, then further choosing the correct accounting treatment for the chosen method. Factors, weightings and ratings have been established through consultation with national asset management experts in order to achieve an objective total score for both alternatives.

As a result of the analysis, Alternative B; ***treat*** standard relining as a new asset, is recommended by both the KT Analysis performed and external asset managers consensus opinion.

7. Discussion Progress

We have completed the above analysis with support from the following individuals:

John Howard of Jeff Roorda & Associates,
Chris Adam of RAMAFIN Pty Ltd,
John Comrie JAC Comrie Pty Ltd and
Dennis Kirby at CT Management Group.

For further queries please contact Vivek Kangesu at Townsville City Council;
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Special notes for all readers:

1. ***Vivek would very much appreciate feedback*** from anyone on any aspect of this work and to this end he is holding it 'in draft form'. So please, if you have suggestions - ring or write to Vivek.

2. ***If you appreciated this view*** of the work at Townsville please tell me (penny@amqi.com)

3. ***If you have recently conducted a piece of analysis*** and would like to add to the general sum of knowledge by sharing it with other readers - please write to me, or ring me on 618 8359 0559.