Decision Support for Trade-off in Asset Management
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SUMMARY

- ABOUT ASSETSMAN
  1. AT A GLANCE
  2. EXPERTISES

- ASSET MANAGEMENT: A Business Model
  1. WHAT IS IT ABOUT?
  2. LIMITS OF ACTUAL SOLUTIONS
  3. BUSINESS NEEDS AND TRADE OFF

- ASSETSVALUE: A Digital Business Model Integrator

- RISK/COST ANSWERS TO BUSINESS NEEDS FOR VALUE CREATION

- CONCLUSION
About Assetsman
Leading enterprise on added value services in Asset Management, Operational Reliability & Life-Cycle Management studies

- 18 years of experience in Asset Management
- Headquarters in France
- Subsidiary in Brazil
- Customers in 28 countries
- More than 1500 projects in Asset Management
- Official Certifier ISO 55001
- Founder of IFRAMI - French Institute of Industrial Asset Management and Infrastructure
- IAM Endorsed Assessor since 2012
- Chairmanship of the AFNOR Committee since its creation in 2011
- Head of the French Delegation ISO TC 251 Committee since 2011
ASSESTMANS’S EXPERTISES

On-site mobilization of expert consultants to support Asset Management projects

Assessments Experts team

Interactive immersion in Everyday Asset Management - Measuring the performance of decisions

- 1 day of simulation
- 1 to 4 tables of 4 participants

Training & Workshop, with concepts application on concrete case studies

ASSESKILL
- Module A - Asset Management
- Module B - Methods and Tools of AM
- Module C - AssetsValue
- Module D - AssetsGame

Cloud-based Decision Tool for supporting the follow-up of Asset Management

INTERACTIVE EVALUATION & DIAGNOSIS

Methods & Tools

- IAMS - ISO 55001 standard
- IAMS - Maintenance Function
- IAMS - Spare Management

Support the company throughout its path in Asset Management until ISO 55001 certification

Methods and Tools for improving overall Operational Performance (Based on Risk / Cost Relationship)

- RCM - Reliability-Centered Maintenance
- RCA - Root Cause Analysis
- RBI - Risk-Based Inspection
- OMEGA - AM Maintenance Order
- Availability analysis
- Risk Analysis (AMDEC, APR, ...)
- AssetsBudget
- AssetsLifetime
- CBA - Core Business Analysis

IAMS - Support the company through its path in Asset Management until ISO 55001 certification
Asset Management: A Business Model
ASSET MANAGEMENT: WHAT IS IT ABOUT?

ASSET MANAGEMENT

« Asset Management involves to balance costs, opportunities and risks compared to required asset performances, in order to achieve the company objectives »

Source: ISO 55000 page 3

To extract value from assets

ASSET

« An Asset is an entity which has a value for the company »

Source: ISO 55000 page 2
LIFE-CYCLE COSTING PROFILE

R&D  Design  Procurement  Construction  O & M  Dismantle & Disposal

Judicious Investment  Make Profitable  Effective Replacement
L IM I T S  O F  A C T U A L  S O L U T I O N S

❑ The actual solutions are deployed to manage:
  – Or the investments
  – Or the maintenance
  – Or the stocks
  – Or the end of life

❑ With specific structures:
  – Departmental silos
  – Segmented objectives
  – Segregated view of stakeholders’ requirements

❑ For perceived expectations:
  – Short term financial results
  – Short term view and appointment
EFFECTIVE ASSET MANAGEMENT APPROACH

Market opportunities

↑ Explore

Enterprise goals

↓ Realize

Corporate Strategies

↓ Operationnal Strategies

LOOKING AFTER ASSETS

M A N A G I N G  A S S E T S ≠ A S S E T  M A N A G E M E N T

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A RANGE OF BUSINESS NEEDS

Are the **intervals of my maintenance activities** correct, considering my costs and the risks to which I am exposed?

When is the **optimum moment of replacement** of my asset and infrastructure?

Do I size correctly my stock of spare parts, with an acceptable risk level?

What opportunities do I have to **bundle my major maintenance shutdowns** at an optimum time?

How can I track the actions of my asset management strategy?

What should be my **investment priorities**, considering my budget constraints?

How can I be supported for the implementation of a strategy in accordance with the **requirements of the ISO 55000 standards**?

WHERE IS MY NEED?
AN OPTIMIZED MANAGEMENT ALONG THE LIFE CYCLE

- The Risks/Costs relationship in each phase of the life cycle
- The three trade-offs of Asset Management

Diagram:

- Investment vs. Operation & Maintenance vs. Renewal
- Long Term vs. Risks vs. Maintenance
- Short Term vs. Costs vs. Replacement
- Corporate Cash Flow vs. Failure Rate vs. Life time (years)
- Investment vs. Operation vs. Renewal
- CAPEX vs. OPEX vs. Life time (years)
Overview:

Assetsvalue

A Digital Business Integrator

Decision Support Tool for an Asset Management Strategy
15


❑ The 3 parts of an Asset Management project (ISO 55001)

- Capabilities
  - From 30 to 50%
  - RISK / COST OPTIMIZATION
    - TRADE-OFF IN MAINTENANCE
    - SHUTDOWN OPTIMIZATION
    - FAST MTBF
    - LCC RENEWAL
    - LCC PROCUREMENT
    - CAPEX PRIORITIZATION
    - STRATEGIC SPARES
    - CONSUMMABLE SPARES

- Management System
  - From 30 to 50%
  - ALIGNMENT
    - ASSET MANAGEMENT PLAN
      - Management system
        - Equipments / Assets
          - (Reliability, Availability, ...)

- Leadership
  - from 20% to 60%
  - ORGANIZATION
    - Structured organization
    - Setting direction and priorities
    - Culture
    - Crossing traditional boundaries
    - Linking asset management thinking and practices
  - LEADERSHIP / COMMITMENT
    - All levels of management from senior executives to supervisors
    - Sufficient influence and authority

✓ Assets value design meets with ISO 55001 requirements
Risk/Cost Answers to Business Needs for Value Creation

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What opportunities do I have to bundle my major maintenance shutdowns at an optimum time?

Optimization of the bundling operation of large shutdowns with a genetic algorithm

**ASSETSVALUE | SHUTDOWN OPTIMIZATION**

**ASSETSVALUE**

- Current bundling of shutdown maintenance tasks
- Individual optimum for each task
- Optimum of the optimums: optimized grouping

**GENERAL SCOPE**

AREA: Pulp and Cellulose Paper Company

SCOPE:
- What is the best intervals for the major maintenance shutdown operations?
- What is the outcome of the bundling operation in terms of business impact?

**OPERATIONAL CONTEXT**

Major maintenance operations during annual shutdown

**CONCRETE RESULTS**

- TOTAL ECONOMIC IMPACT MODEL
- SCENARIOS:
  - CURRENT POLICY
  - INDIVIDUAL OPTIMUMS
  - COMMON OPTIMUM
- LOSS OF PROFITS CALCULATED

**ECONOMIC BENEFITS**

- 25% SAVINGS COMPARED TO CURRENT POLICY
- T.E.I AFTER BUNDLING = 2720 K€/YEAR --- PROFITS = 930 K€ / YEAR
**Decision Support for Trade-off in Asset Management**

Gilles Bocabarteille
Strategy and Business Development Manager

**ASSETSVALUE | STRATEGIC / CONSUMABLE STOCK**

Do I size correctly my stock of spare parts, with an acceptable risk level?

Define the best strategy for storing spare parts.

Which stock value to immobilize and for which exposure to risk?

**ASSETSVALUE**

Inventory level decision chart, with optimum on acceptable risk (ex. Strategic Stock)

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Do I size correctly **my stock of spare parts**, with an acceptable risk level?

Define the **best strategy** for storing spare parts.

Which stock value to immobilize and for which exposure to **risk**?

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**a business case reference**

**GENERAL SCOPE**

AREA: Water & Electricity Product® Company

SCOPE:
Which are the strategic / consumable spares to **discard 1**, **maintain — or increase 1** in stock, regarding their economic impact?

**OPERATIONAL CONTEXT**

✓ 45,000 spares, 3 production plants, 10 independent stations
✓ Conservative storage policy

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**ECONOMIC BENEFITS**

15% **TANGIBLE SAVINGS COMPARED TO CURRENT POLICY**

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**CONCRETE RESULTS**

- TOTAL ECONOMIC IMPACT (€/year)
- OPTIMUM SPARES POLICY UPDATE
- SAVINGS CALCULATED
When is the optimum moment of replacement of my asset and infrastructure?

Determining the best renewal strategy, and the optimum moment of replacement.

**ASSETSVALUE | LCC RENEWAL**

**EAC**: Equivalent Annual Cost of Asset Candidates

Comparison of optimum time of replacement

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**GENERAL SCOPE**

AREA: Aluminium Product® Company

SCOPE:
What are the best optimum replacement plan for 50 assets?

**OPERATIONAL CONTEXT**

✓ 50 industrial assets

**CONCRETE RESULTS**

- 50 STUDIES PERFORMED
- OPTIMUM TIME OF REPLACEMENT
  ✓ (Classified from 2015 to 2018)
- IDENTIFICATION OF ASSETS REPLACEMENT TIME OVERDUE
- SAVINGS & PENALITIES CALCULATED

**REPLACEMENT TIME OVERDUE = 31 / 50 ASSETS**

- PENALTIES / CAPEX: 42%
- TANGIBLE PENALTIES FOR 1 YEAR POSTPONING

- DELTA OPEX / CAPEX: -55%
- SAVINGS OPEX PER YEAR AFTER REPLACEMENT
What should be my investment priorities, considering my budget constraints?

Prioritization of annual investments under budget constraints

a business case reference

**GENERAL SCOPE**
AREA: Chemical Production Plant
SCOPE:
Which CAPEX Sustaining projects should be prioritized for the 5 next years?
What is the right time to replace an asset in order to minimize its life cycle cost, and maximise its ROI?

**OPERATIONAL CONTEXT**

- 40 investment projects
- 17 selected candidates to LCC modelling

**CONCRETE RESULTS**

- 5 different investment plans proposed as a result of several Premium Value Analysis.

**5 PLANS**

- **ONE SHOT - 0 K€**
- **PREMIUM - 1537 K€**
- **PREMIUM+ - 1759 K€**
- **FIXED - 1809 K€**
- **EXTENDED - 2346 K€**

Renewal projects & individual premiums
Smoothing projects under budget contrains
How can I track the actions of my asset management strategy?

**SAMP Documentation** (including Policy, Strategy, Objectives, Plans)

A business case reference

For an airport infrastructure company

- Build a step-by-step strategic **alignment** in asset management
- Formalize the **Strategic Asset Management Plan**
- **Monitor** objectives and track achievement in Asset Management
- Obtention of **ISO 55001 certification**
- « Anniversary » audit performed.
Conclusion
CONCLUSION

❑ The Business environment
  - **Increased demand** makes more complex operations on Assets and Infrastructures.
  - **Capex strategy and efficient performance** have to be considered over the Assets and Infrastructures life cycle.
  - **Risks management** is critical along with the management of resources and the costs.

❑ Asset Management: a winning strategy with the right Tool and the right Leadership
  - Impose **alignment** with Company objectives.
  - Cope with the **expectations** of all the stakeholders.
  - Provide a **risk/cost optimized view** of the Assets and Infrastructures Life cycle.
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