

3rd Leading Edge Conference on **Strategic Asset Management**

**A rehabilitation planning handbook
for water supply infrastructures**

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LESAM 2009 – Miami 11-13 November 2009



*** LNEC**



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Contents

- Context and handbook objective
- Rehabilitation drivers
- Integrated approach for rehabilitation
- Handbook contents
- Strategic planning
- Tactical planning
- Final remarks

Contents

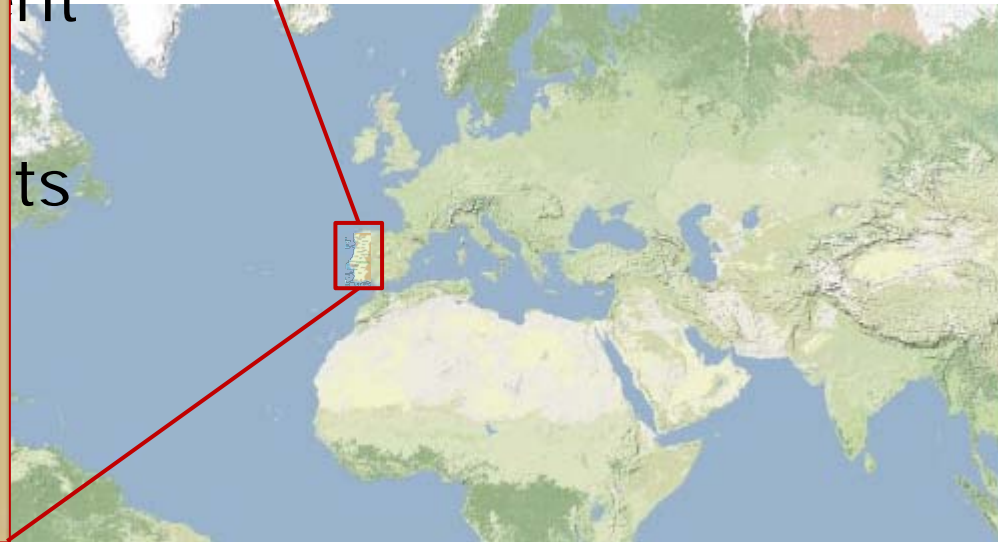
- **Context and handbook objective**
- Rehabilitation drivers
- Integrated approach for rehabilitation
- Handbook contents
 - Planning
 - Planning
 - Remarks





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in the past 15 years
 has provided
 organisational framework
 new infrastructures
 nt
 ts



What is needed?

- International networking
- National & regional SAM policies
- Change of culture of politicians, policy makers, utility managers, engineers, customers, society in general
- Cooperation between all stakeholders (utilities, users, researchers, academy, regulators, manufacturers, consultants, enterprises)
 - Individual initiatives are not effective
- Clear guidance, training and support tools to decision makers

What is needed?



Advanced Water Asset Rehabilitation in Portugal

AWAREP»

(2009-2011)

www.aware-p.org

or

www.aware-p.com

AWARE-P vision

- Awareness
- Change of culture
- Networking
- Know-how for sustainable urban water services

For the international community



AWARE-P outputs

(by 2011)

- Two **rehab handbooks**
- **Computer decision support applications**
- **User manuals** of the software
- **Pilot studies / demonstration cases**
- **Training courses** (direct teaching)
- Materials for **e-learning** courses
- Dissemination platform (web-based)
- Technical and scientific papers

AWARE-P outputs

(by 2011)

- Two rehab handbooks
- Computer decision support systems
- User manuals
- Pilot studies
- Training courses
- Software (EPANET style)
- Scientific papers

• Portuguese & English

• Public domain / open source

• software (EPANET style)

AWARE-P outputs

(by 2011)



Two rehab handbooks

- Computer decision support applications
- User manuals of the software
- Pilot studies / demonstration cases
- Training courses (direct teaching)
- Materials for **e-learning** courses
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- Technical and scientific papers



Handbooks

- Scope:
 - HB1 – Rehab of transmission and distribution systems
 - HB2 – Rehab of wastewater drainage systems
- Objective
 - Provide detailed guidance for rehab planning
- Published by IRAR (the National Regulator)
 - Full drafts ready
 - Currently under public discussion & revision
- Directed to utility managers
 - asset owners, asset managers and asset operators

Handbooks

■ Scope:

- **HB1 – Rehab of transmission and distribution systems**
- HB2 – Rehab of wastewater drainage systems

■ Objective

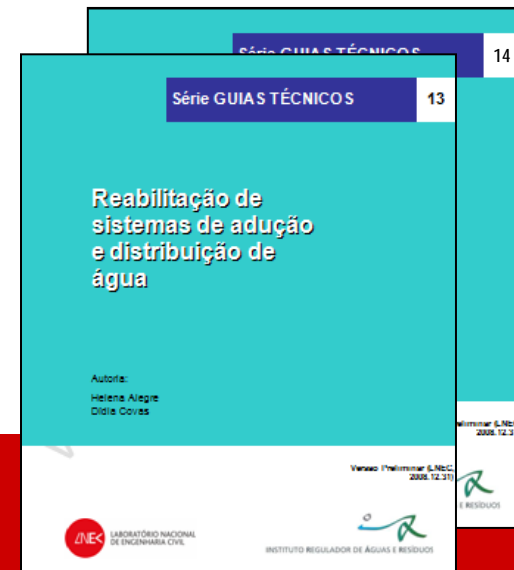
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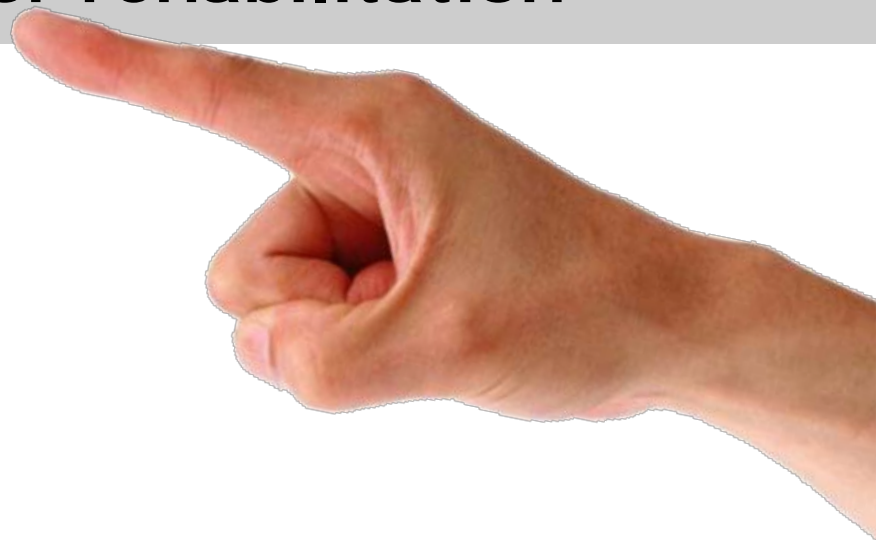


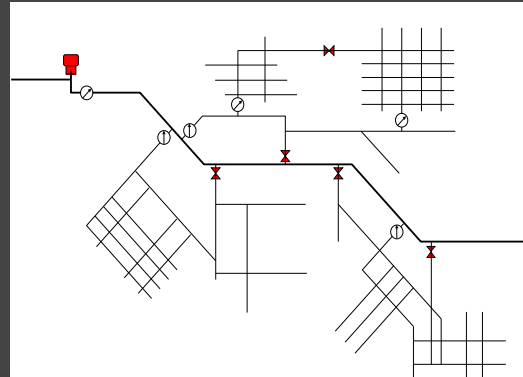
REHAB DRIVERS:

- ✓ Promoting adequate **service levels** and **reliability**
- ✓ Managing risk of service failure, taking into account **users' needs and risk acceptability**
- ✓ **Extending service life** of existing assets
- ✓ **Improving** investment and operational **efficiency**
- ✓ **Justifying investment priorities**
- ✓ Improving the **sustainable use of water and energy**
- ✓ Planning for **climate change** in a phased way

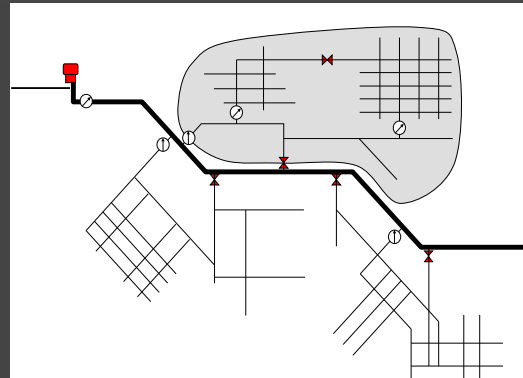
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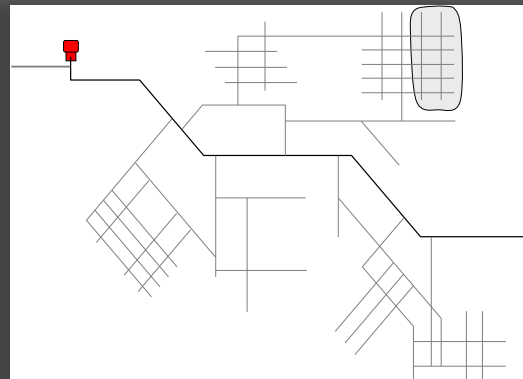




**Strategic
level**



**Tactical
level**



**Operational
level**



**Strategic
level**



**Tactical
level**



**Operational
level**



**Strategic
level**



**Tactical
level**



**Operational
level**

- External global context
- Stakeholders' specific context
- Internal context

Define rehab STRATEGIES, as part of the utility strategic plan

Strategic level

Rehab tactical planning process

Consider asset solutions

Consider non-asset solutions

Tactical level

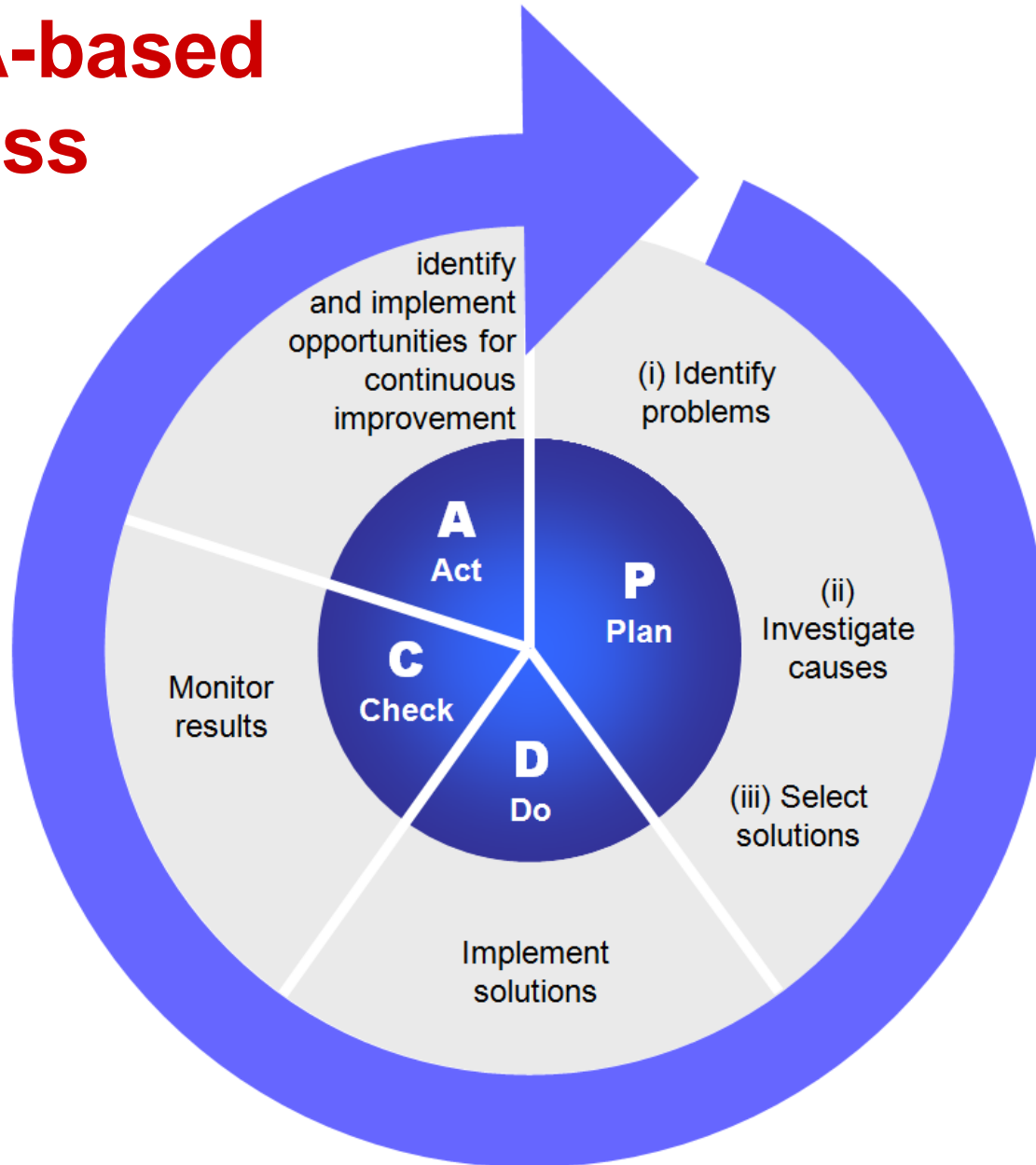
Define Rehab TACTICS and produce rehab plan

Implement rehab plan(s)

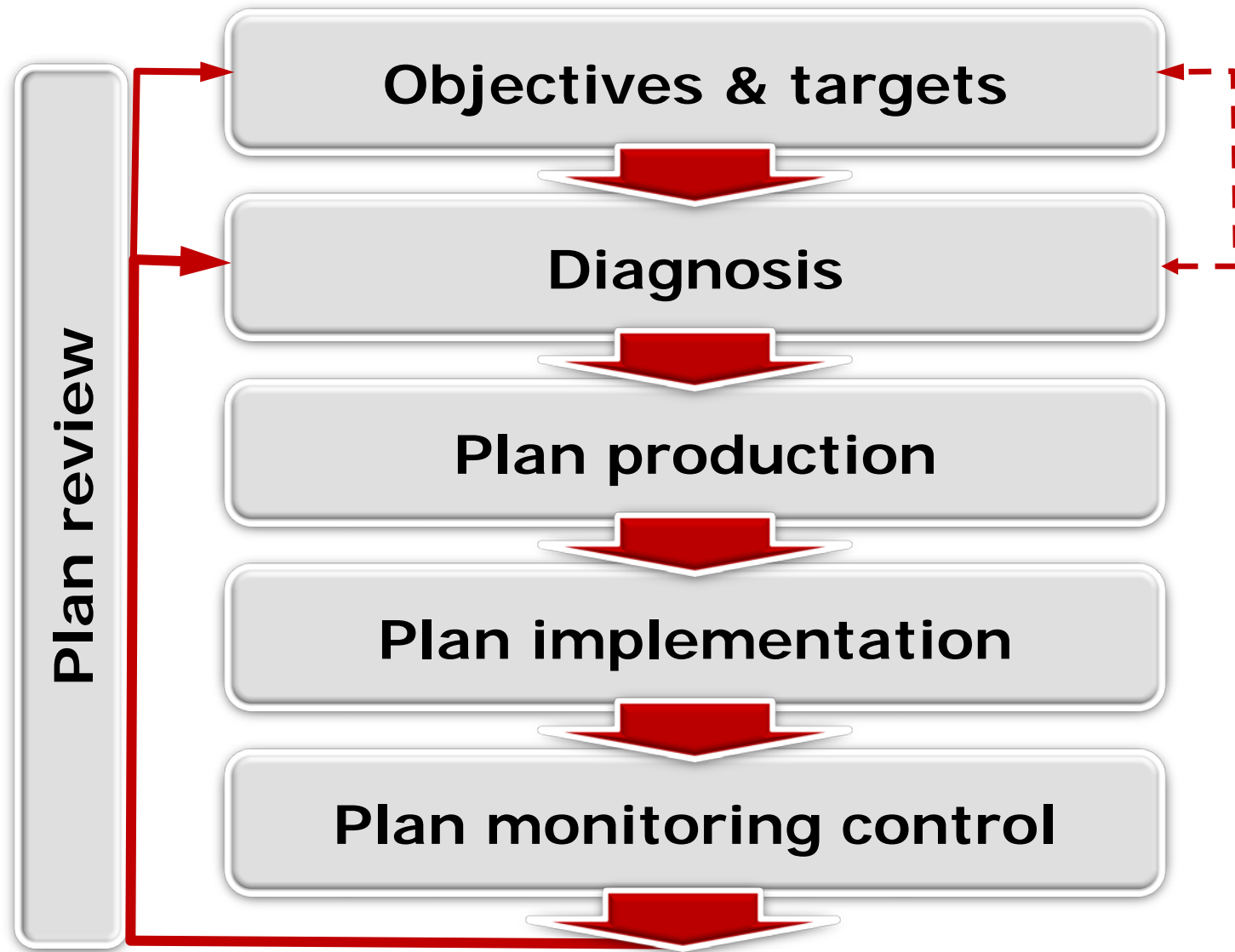
Operational level

Monitor and review

PDCA-based process

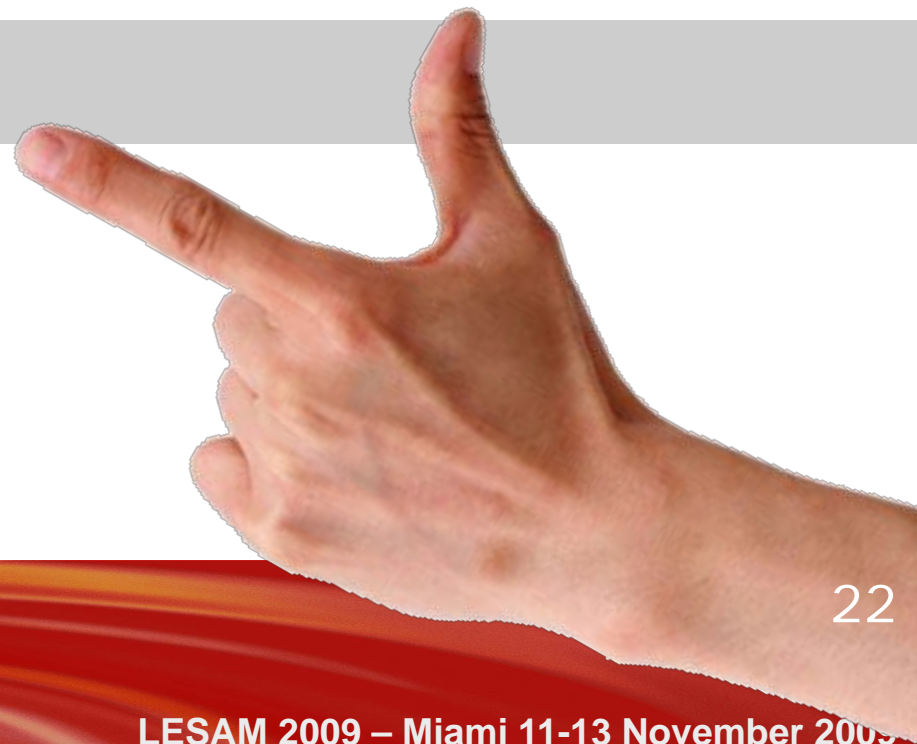


At each stages of planning process...



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- Context and handbook objective
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HANDBOOK CONTENTS

PART I – General context

1. Introduction
2. Rehabilitation relevance and basic concepts
3. Rehabilitation in the context of infrastructure asset management

PART II – Integrated approach to rehabilitation

4. Global framework
5. Rehabilitation strategic planning
6. Rehabilitation tactical planning
7. Rehabilitation operational planning
8. Rehabilitation planning for small and medium utilities

PART III – Rehabilitation support tools and techniques

9. Rehabilitation support tools and methodologies
10. Rehabilitation techniques

References

Appendices

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PART I – General context

1. Introduction
2. Rehabilitation relevance and basic concepts
3. Rehabilitation in the context of IAM

- › Handbook introduction (scope, structure, target public)
- › Rehab relevance (drivers, consequences, symptoms)
- › Rehab and IAM (management components - ISO 24512: 2007)

6. Rehabilitation tactical planning
7. Rehabilitation operational planning
8. Rehabilitation planning for small and medium utilities

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7. Rehabilitation operational planning
8. Quick reference guide

- › The core of the handbook
- › Guidelines for level of planning
- › Digest of the procedure and guide for small and medium utilities

Appendices

HANDBOOK CONTENTS

PART I – General context

- › Main support tools (software applications, methodologies, equipment)
- › Pipe and storage tank rehabilitation techniques



TrasabXL 4.0 - Inicio: Definições

1. Identificação do projeto

Projeto a utilizar nos planos dos padrões do sistema: 100-74

2. Medidores/contadores de caudal

	Medidor 1	Medidor 2	Medidor 3
Modelo			
Modelo/contador (Medidor 1) (m³)			
DN do contador/medidor (mm)			
DN do contador de medição (mm)			
Área de medição			
Data de última calibração			
Valores característicos			
Coeficiente de perda (C1)	20		
Coeficiente de perda (C2)	20		
Coeficiente de perda (C3)	20		
Coeficiente de perda (C4)	20		

3. Caracterização da geometria da rede

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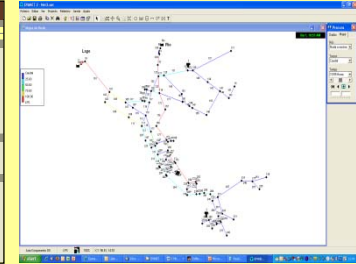
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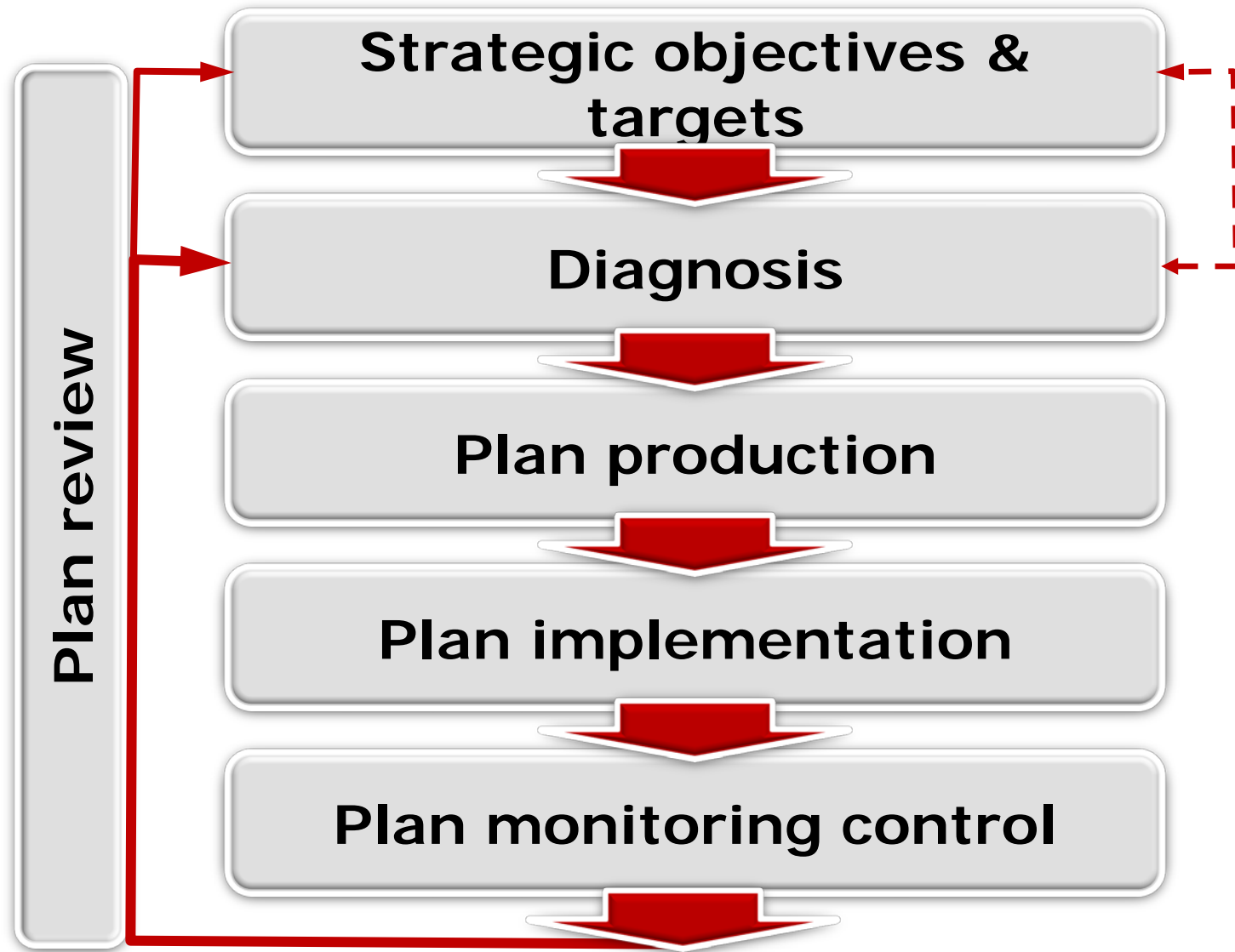
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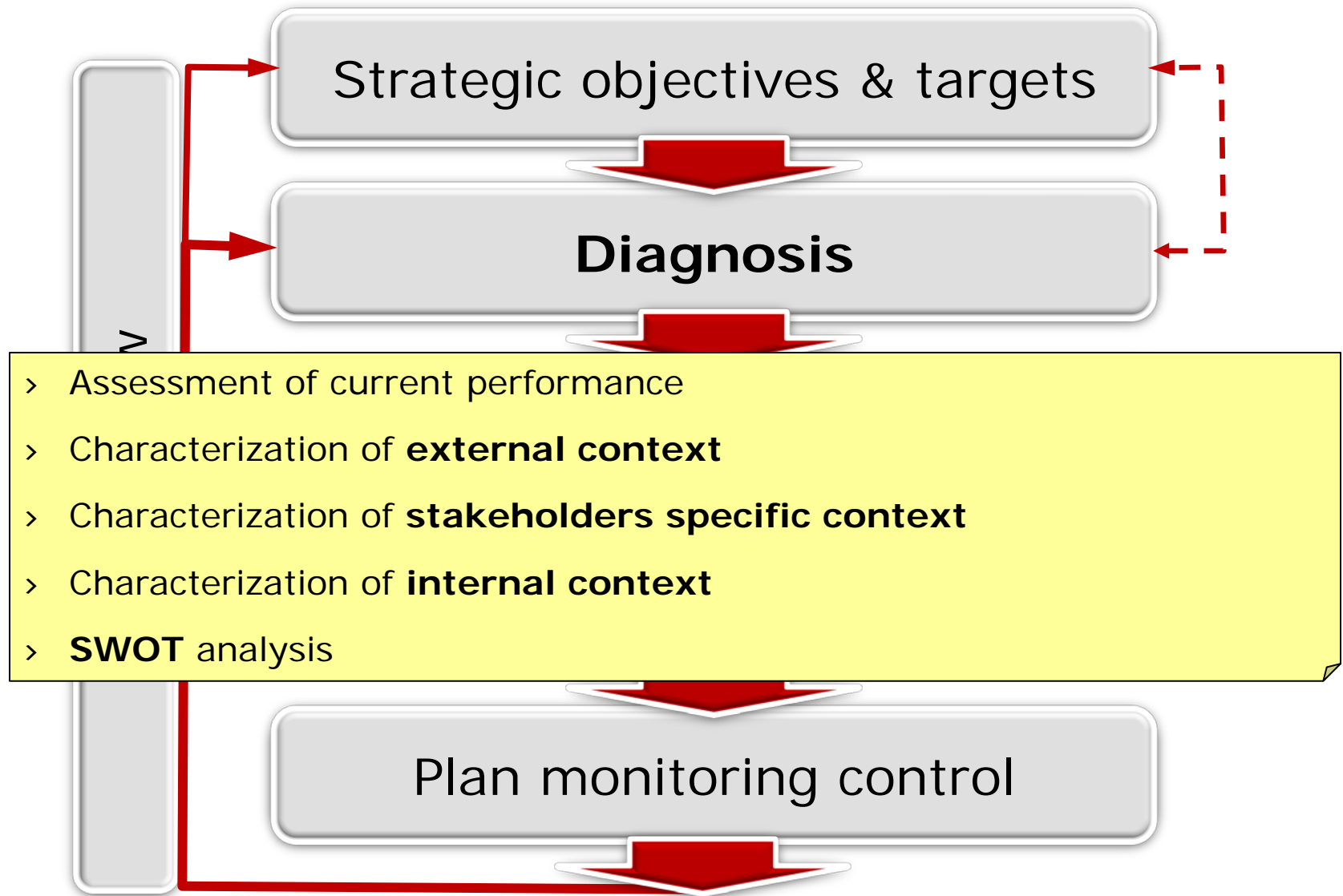
Strategic planning



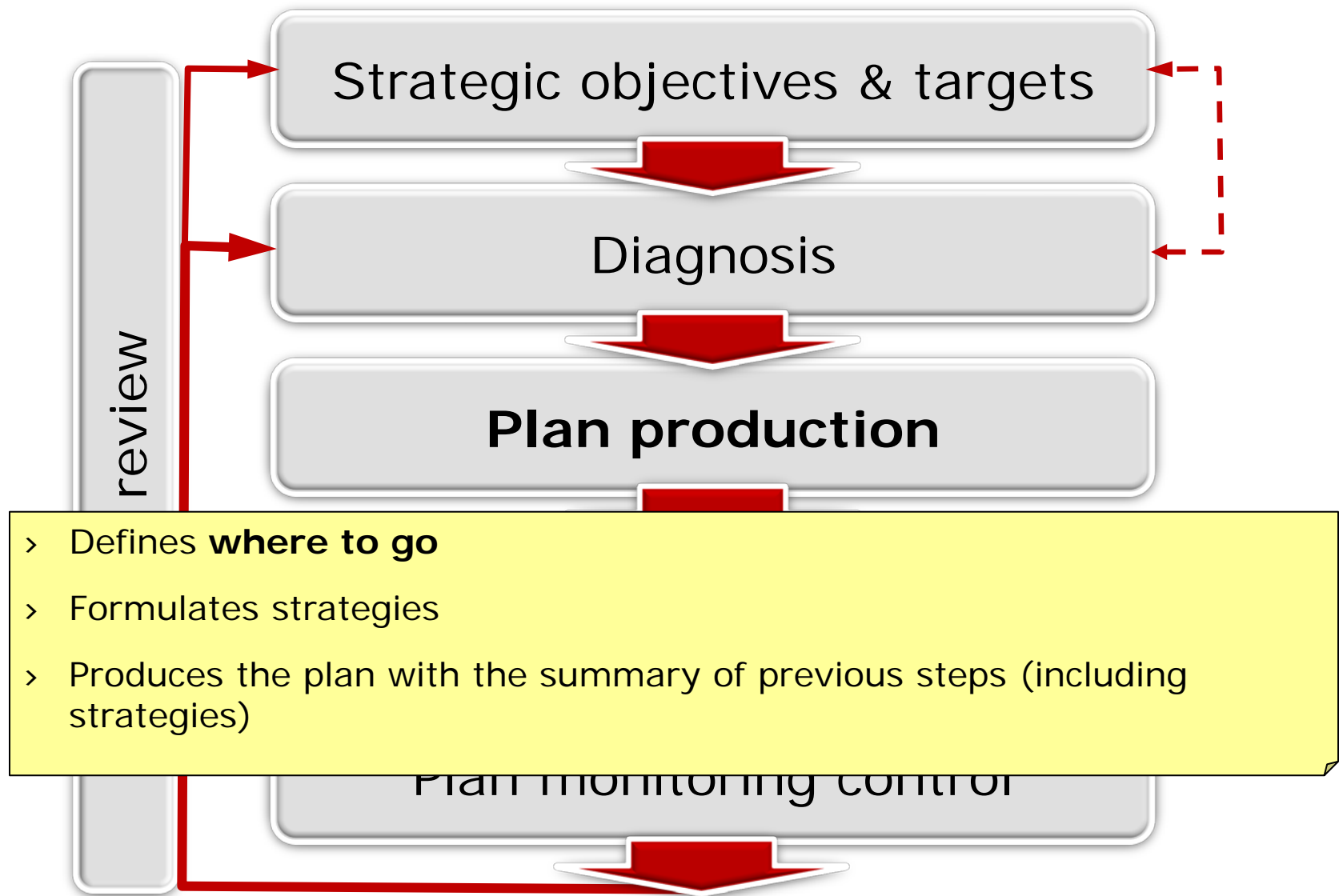
Strategic planning



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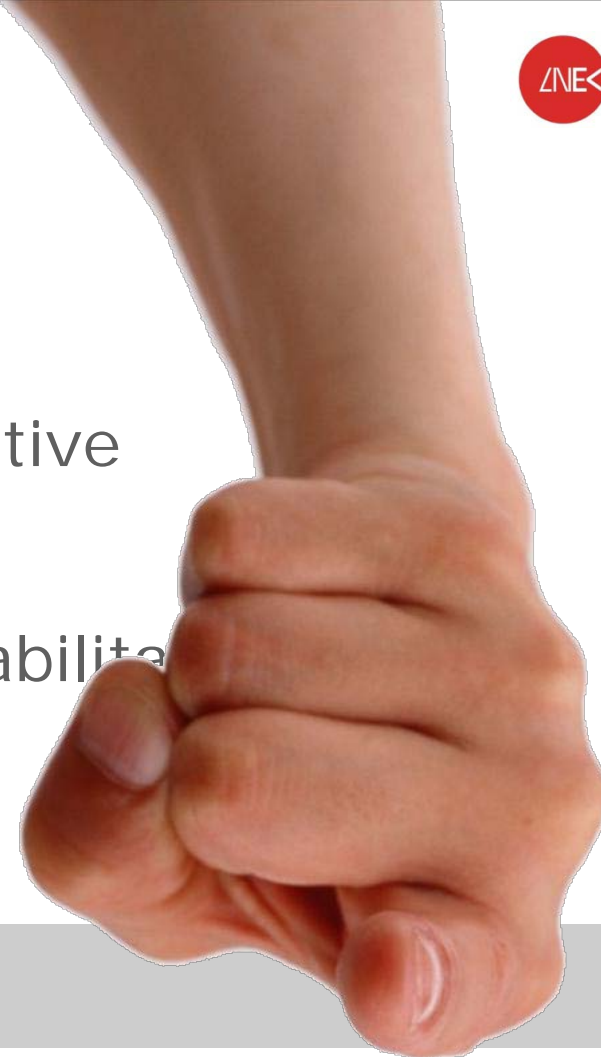


Strategic planning

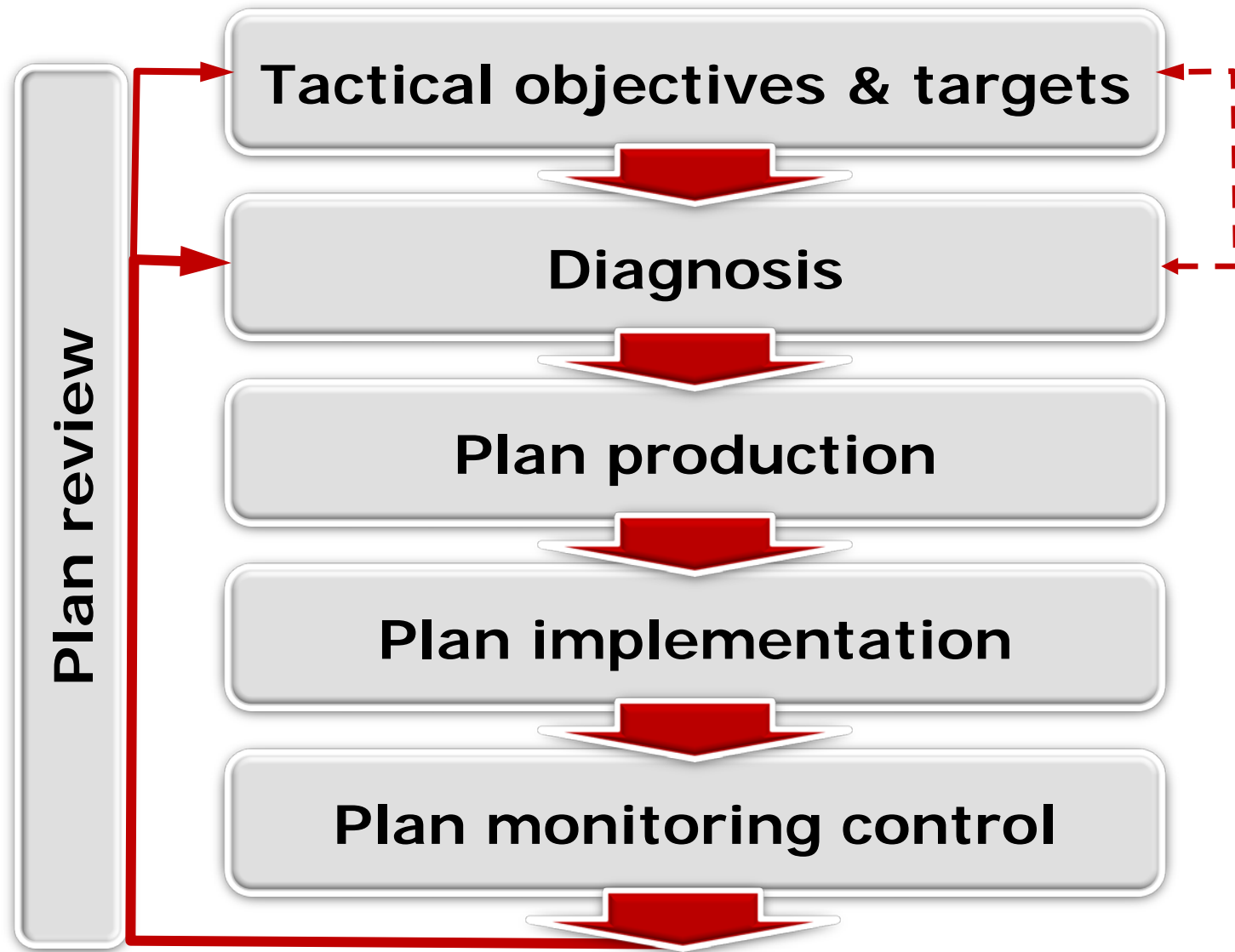


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Tactical planning



Tactical planning



Tactical planning



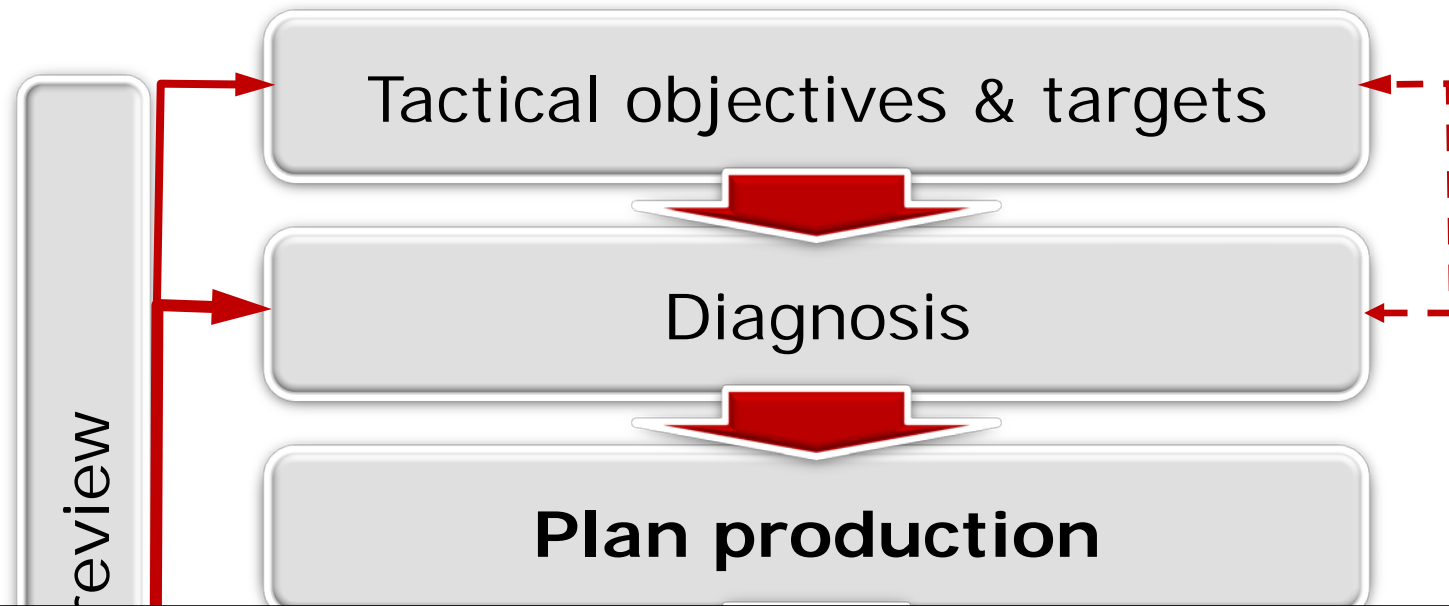
› Identification and analysis of information

- › Identification of necessary information
- › Identification and analysis of existing data
- › Identification of information gaps
- › Establishment of procedures for data collection

› Information collection and performance assessment

- › Identification of critical components and subsystems
- › Assessment of reference (current) situation
- › Prediction of future situation based on *statu quo*
- › Identification of priorities for critical components and subsystems

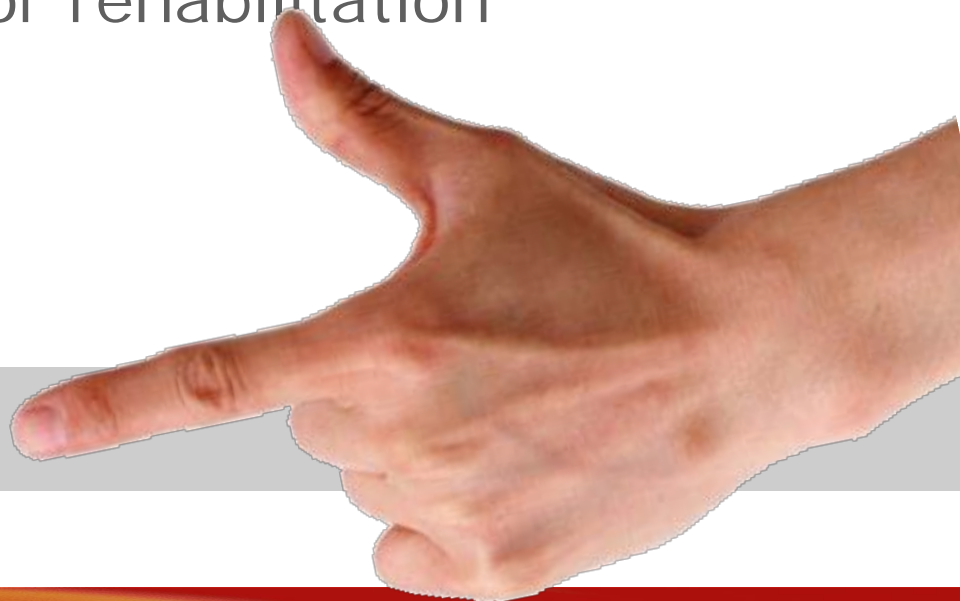
Tactical planning



- › **Identification and analysis of alternative solutions**
 - › Identification of alternative solutions
 - › Prediction of future performance for alternative solutions
 - › Selection of the best solution for each subsystem
 - › Establishment of priorities
- › **Formulation of tactics**
 - › Infrastructural rehab tactics
 - › O&M tactics
 - › other tactics
- › **Plan production**

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“Digest” with simplified procedures included

Some hints

✓ ***CEO decide to change statu quo***

✓ ***SAM is all about people***

- ✓ ***• Leadership***
- ✓ ***• Co-ordination***
- ✓ ***• Collaboration***
- ✓ ***• Corporate culture acceptance***
- ✓ ***• Team building***
- ✓ ***• Motivation***
- ✓ ***• Commitment***
- ✓ ***• Know-how***

make it simple


g data: recycle!

vice

software

ns with peers

Some hints

- 
- ✓ *CEO decide to change*
 - ✓ *SAM is all about people*
 - ✓ *Go phased, step by step*
 - ✓ *Get the most of people to recycle!*
 - ✓ *Balance external experts*
 - ✓ *Do not start by buying IAS software*
 - ✓ *Share problems and solutions with peers*
 - ✓ ***Make it happen***

To conclude...

- SAM is a must for any urban water utility, in any country
- SAM needs to be addressed at strategic, tactical and operational levels
- The AWARE-P project and its rehab handbooks are a step forward

Acknowledgements

All AWARE-P partners and sponsors

