

2nd IWA Leading-Edge Conference & Exhibition on **Strategic Asset Management**

Technical condition assessment of metallic water supply pipes as part of their rehabilitation planning

Hans-Christian Sorge

LESAM 2007 – Lisbon 17-19 October 2007

Structure

1. Reasons for application
2. Assessment method
3. Conclusion/ Discussion



Why you should implement technical condition assessment?



Repair, renovate or renewal?

Why you should implement technical condition assessment?



Apparently
undamaged
pipe wall
segment...

Why you should implement technical condition assessment?



...
or a corroded
pipe wall
segment?

Why you should implement technical condition assessment?



Scrap metal...

Why you should implement technical condition assessment?



... or important
background
information

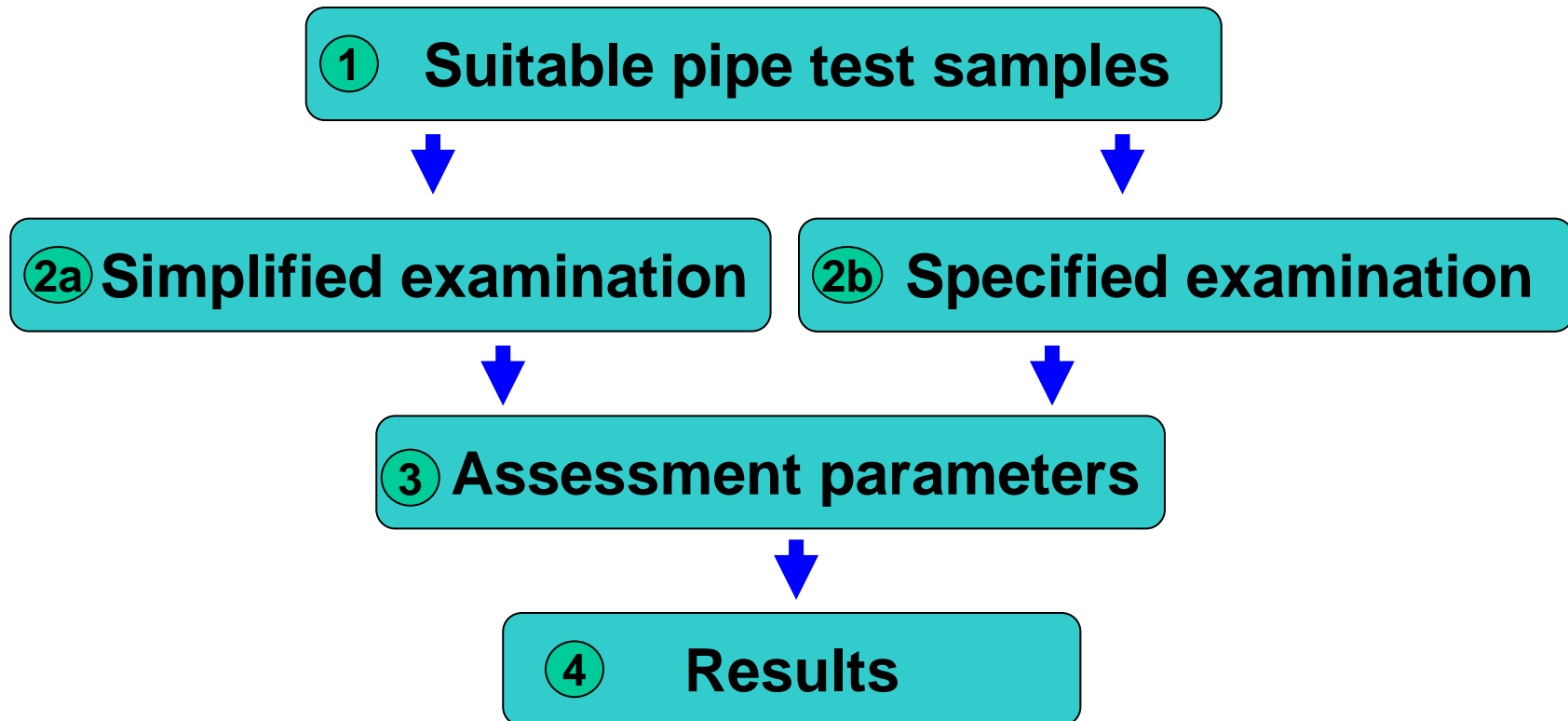
Parameters from TCA – necessary results

- Technical operating life / service life
- Remaining operating life (until total failure)
- Remaining load bearing capacity of pipelines
- Possibility of renovation
- corrosion potential / corrosion protection

Why you should implement technical condition assessment?

- Permanently deterioration of water mains
- No possibility for observation
- Simple damage reports don't have sufficient information to
 - assess the technical condition
 - predict the technical operating life
 - choose an adequate renovation method
- Determining capital assets

Assessment method – TCA



Assessment method – order of TCA

- Quality of corrosion protection
- Methods of pipe producing, period of construction, so called pipe generation
- Typical kinds of corrosion resp. damage symptoms and their dimension

= simplified examination (Basis)



Assessment method – order of TCA

Specified examination depending on necessary precision of results by:



- Metallographic analysis to detect the unequivocally metallic material and incipient corrosion
- Static parameters like tensile strength, elastic modulus, tensile stretch
- soil resistance, corrosion potential

Assessment method – Prognosis of technical operating time

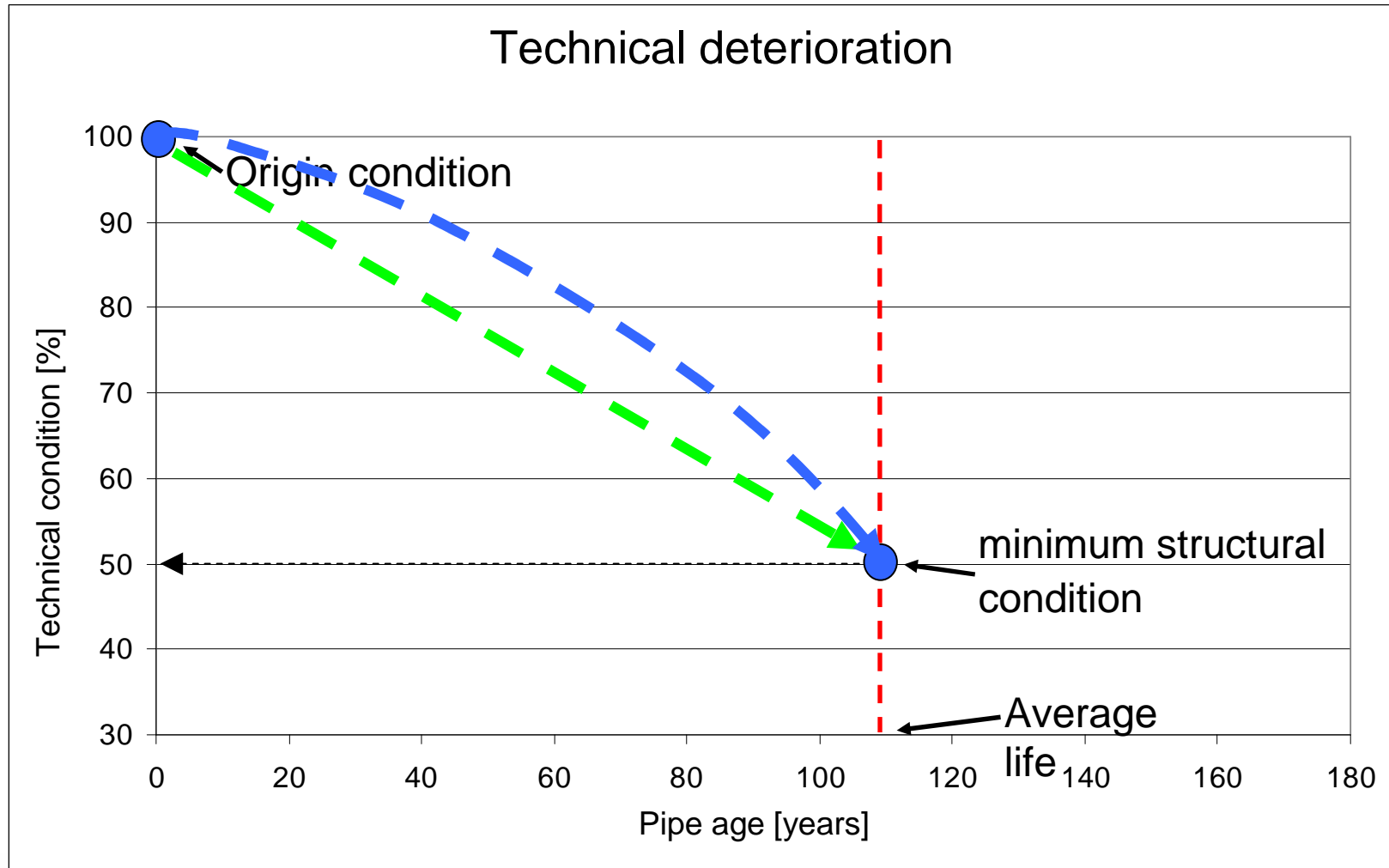
Assumption:

- Actual state = $RWT/t \bullet 100$ [%]
- minimum structural condition = $t_{min}/t \bullet 100$ [%]

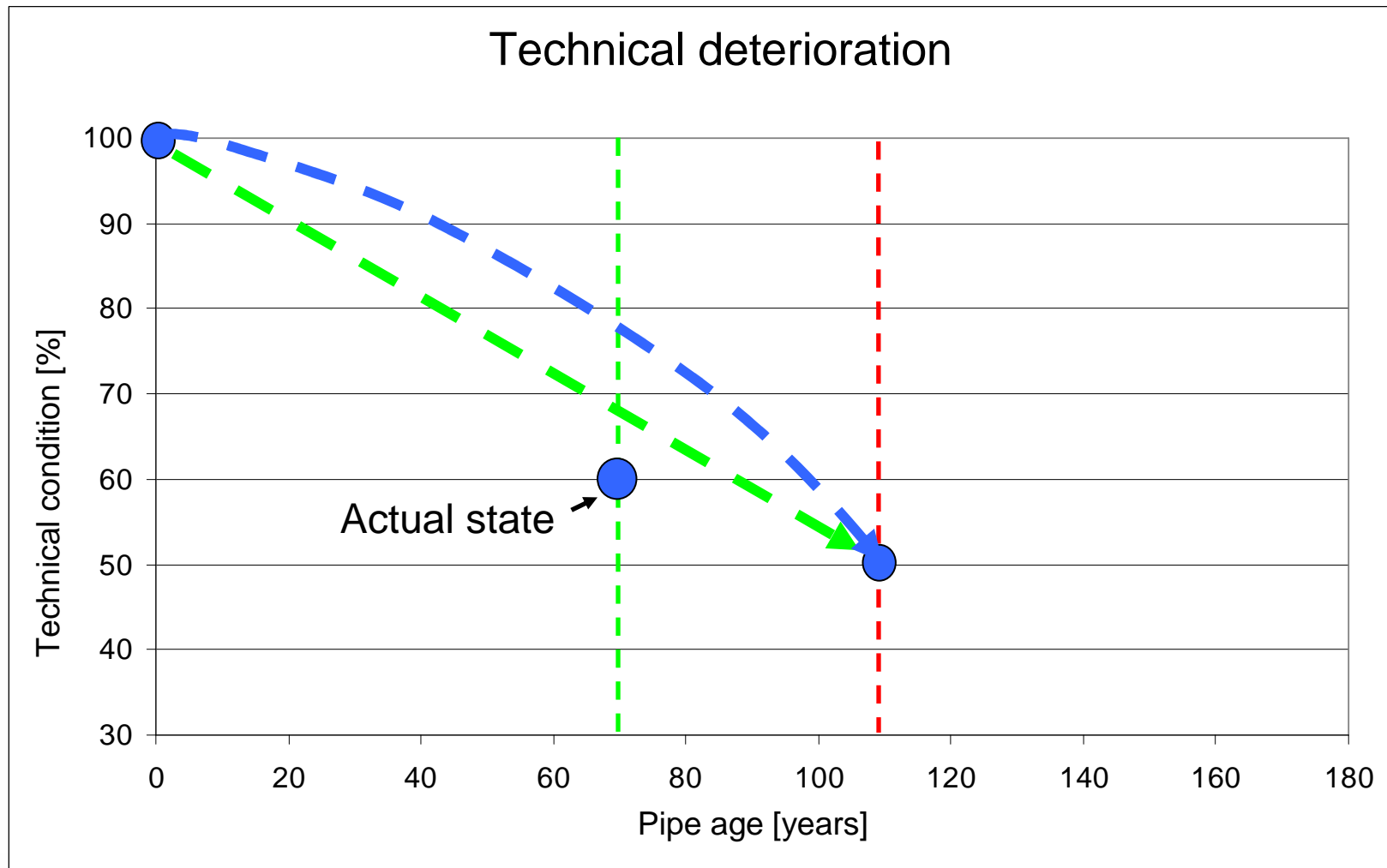
Limitation:

- $RWT > t_{min}$
- Corrosion pit diameter < 15 mm (10 bar)
- no cracks or deformations on pipe

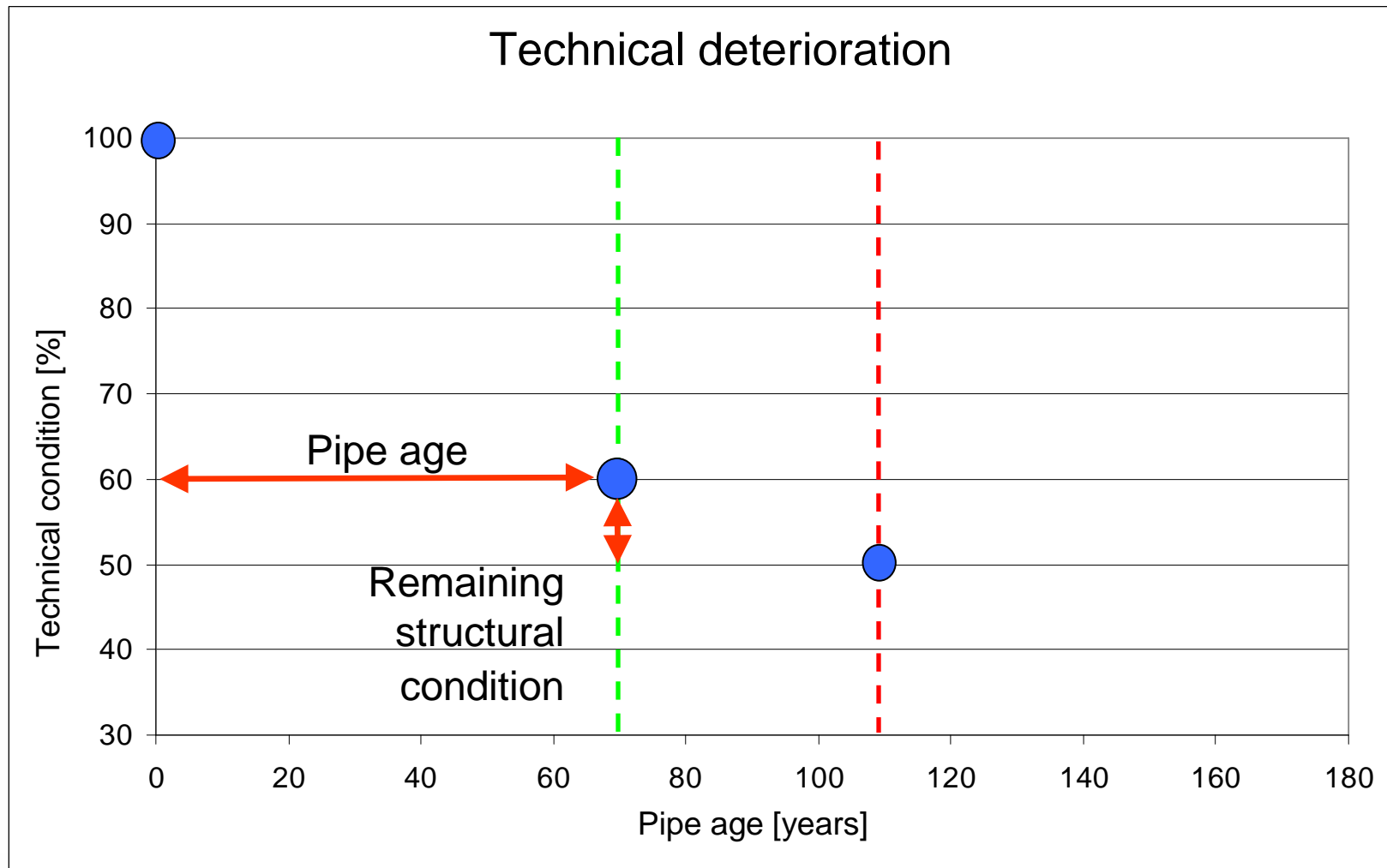
Prognosis of technical operating time



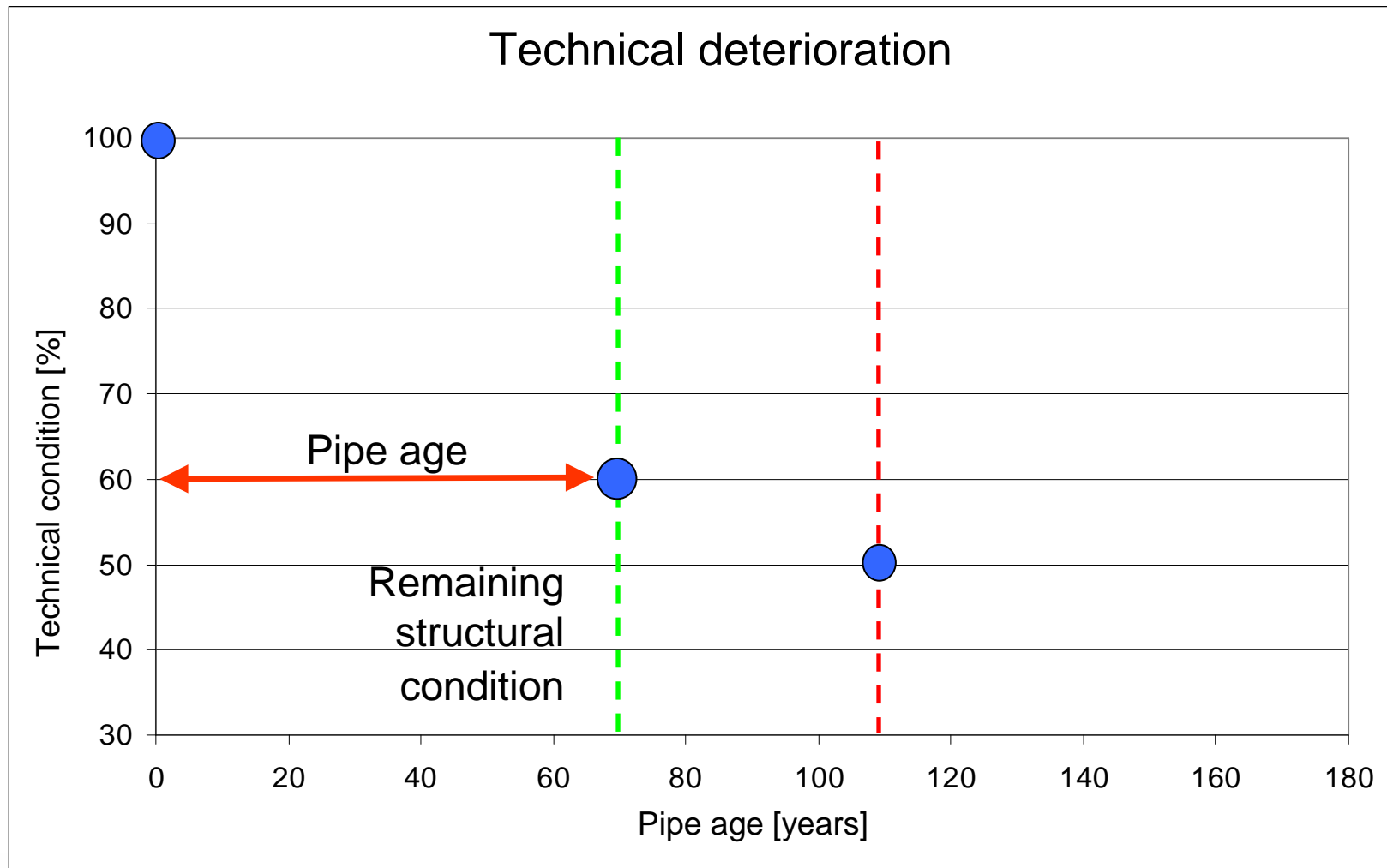
Prognosis of technical operating time



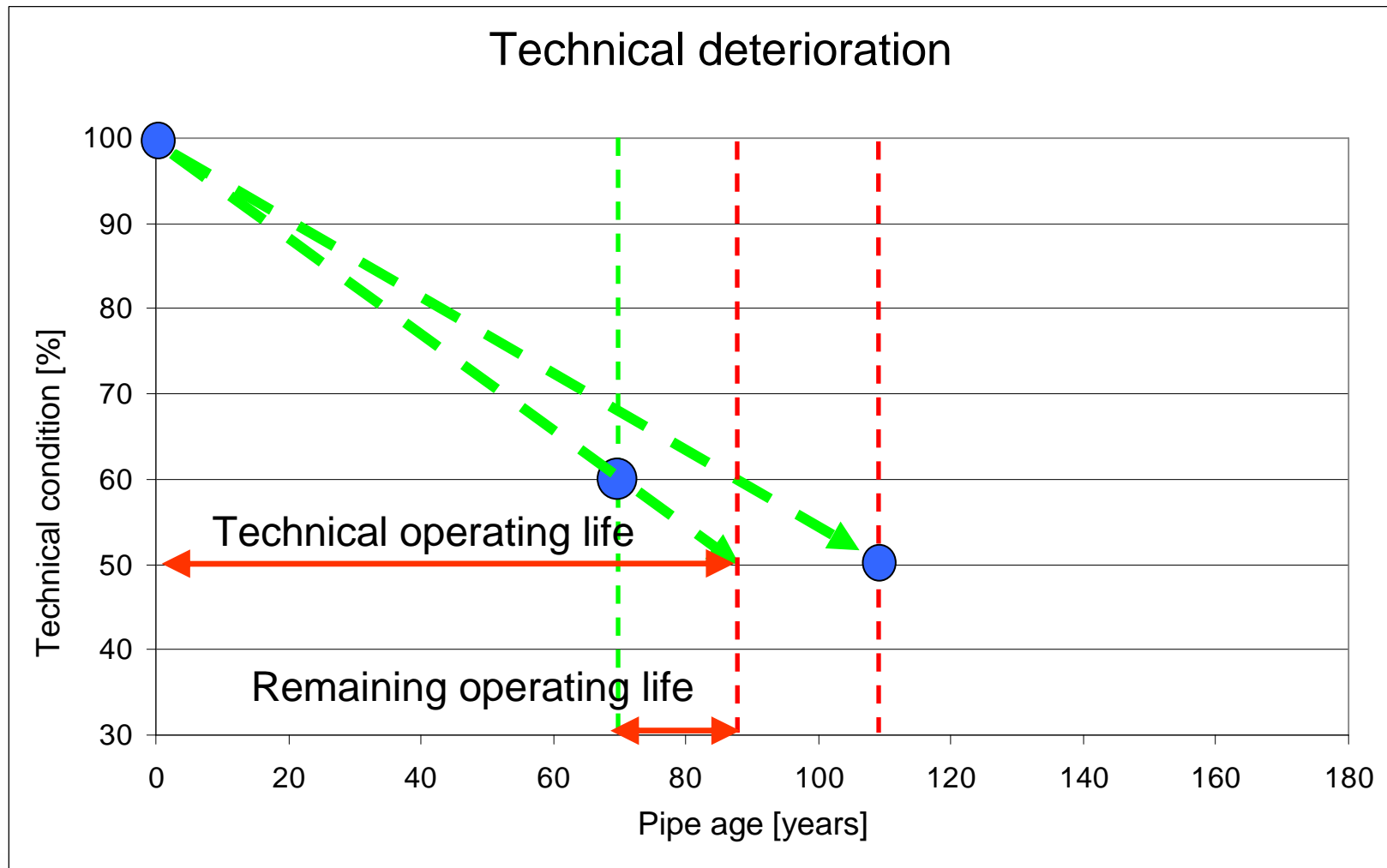
Prognosis of technical operating time



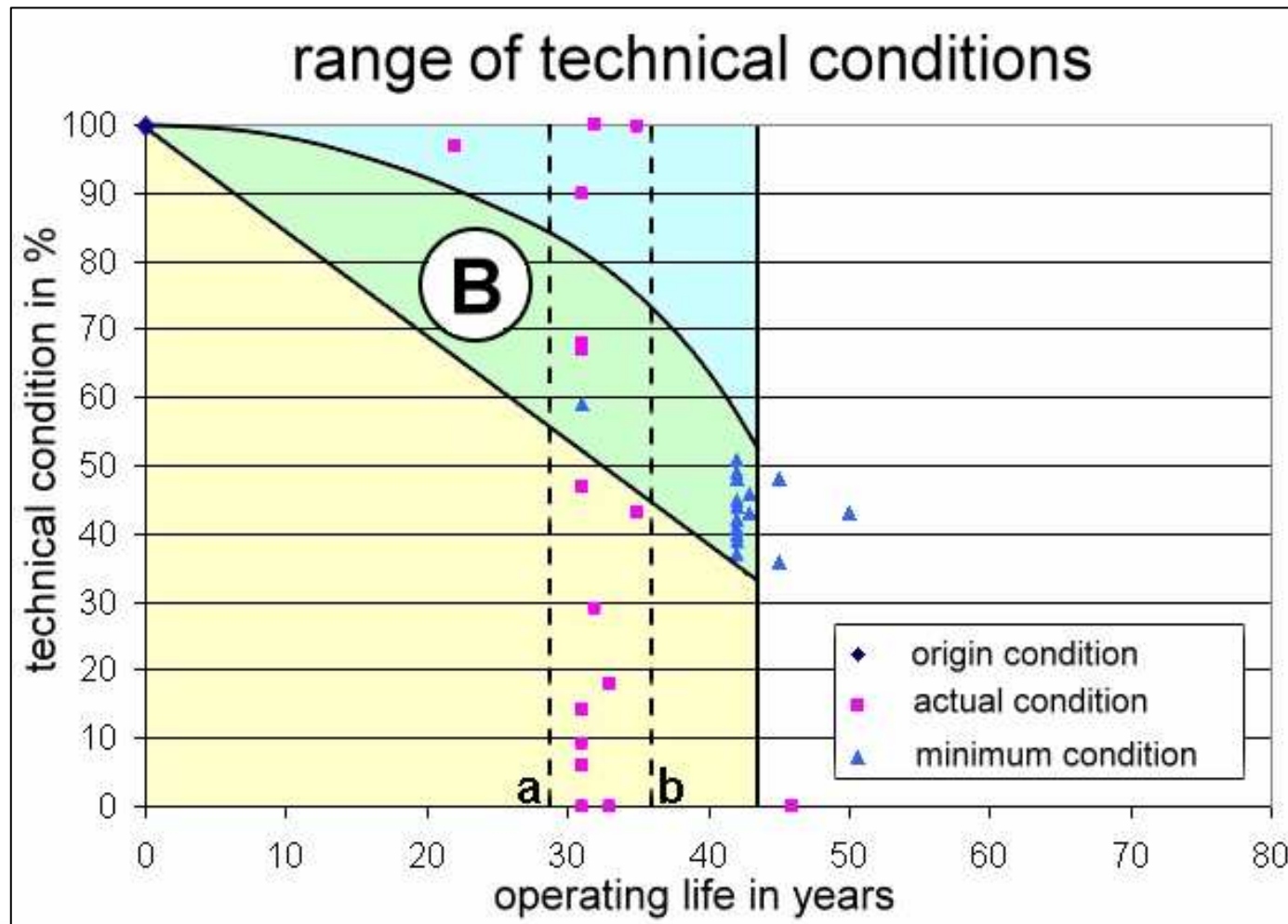
Prognosis of technical operating time



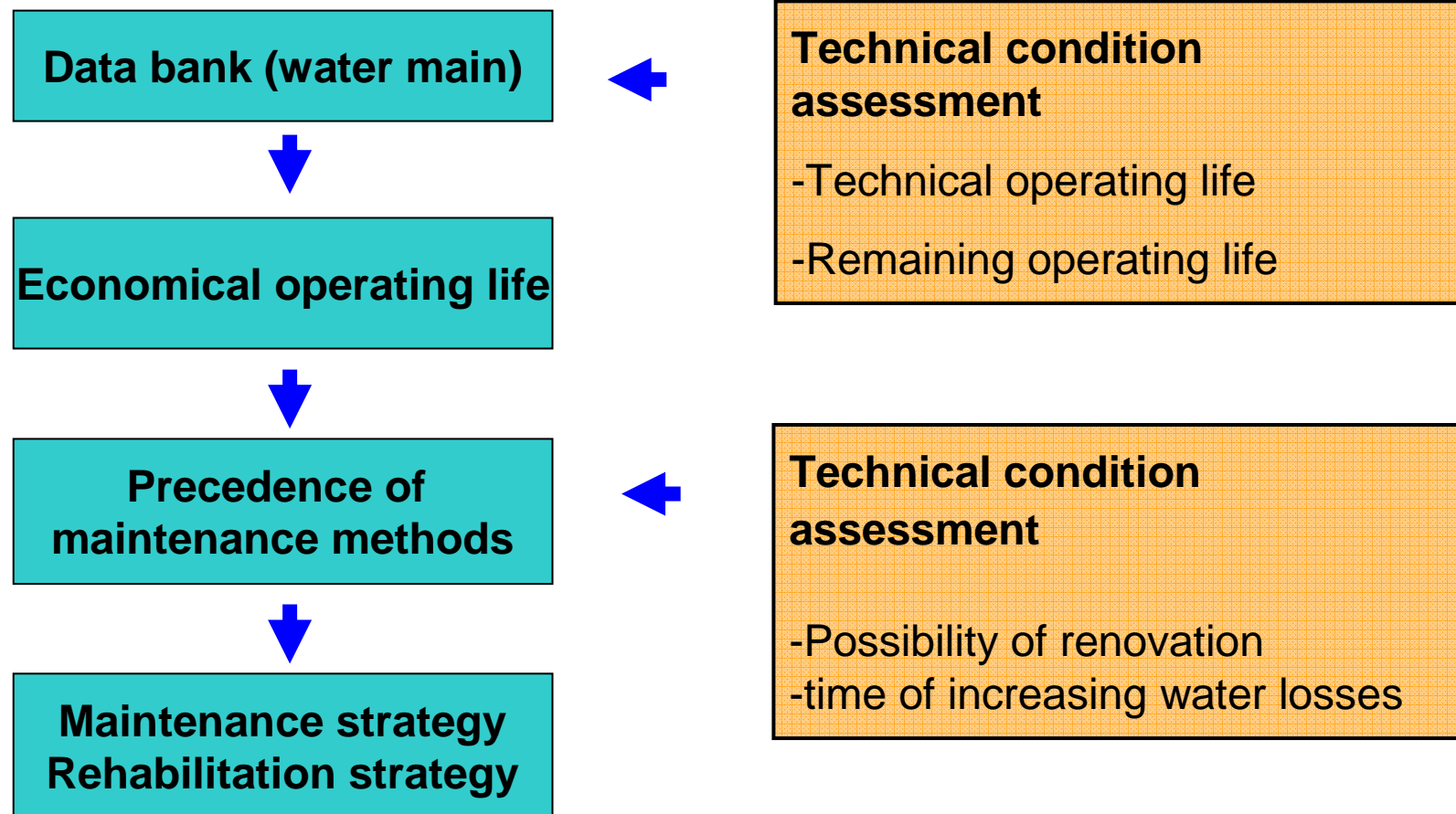
Prognosis of technical operating time



Application and usability



Application and usability



Application and usability

- Life Cycle Engineering
- Optimum resp. economical time of renovation or renewal
- Trends of deterioration and breakages, prevention of water losses
- Using of results in assessment software

Application and usability

- Keeping and increasing the supply quality
- Saving of maintenance costs
- Advanced and sustainable maintenance, based on technical conditions of water mains

Conclusion/ Discussion

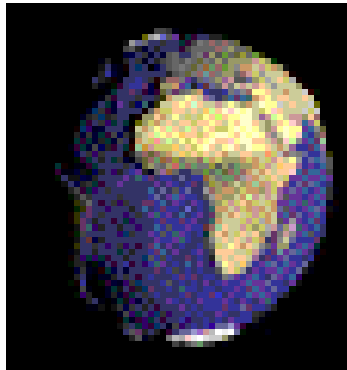
- Capturing of more essential parameters than in breakage rate statistic (parameters like backfill properties, soil resistance etc.)
- Using of convincing examination results
- Possibility to estimate the degree of deterioration before breakages / water losses appear

Conclusion/ Discussion

- Transfer of examination results to comparable parts of the water supply network
- Calculating the definitely remaining life time of pipe lines/ total failure
- Allows sure and certain decisions about the right time to renovate or renewal

Thank you for your interests!

Contact:



www.fitr.de



+49 3643 82 68 0



E-MAIL

postmaster@fitr.de



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