Target Levels

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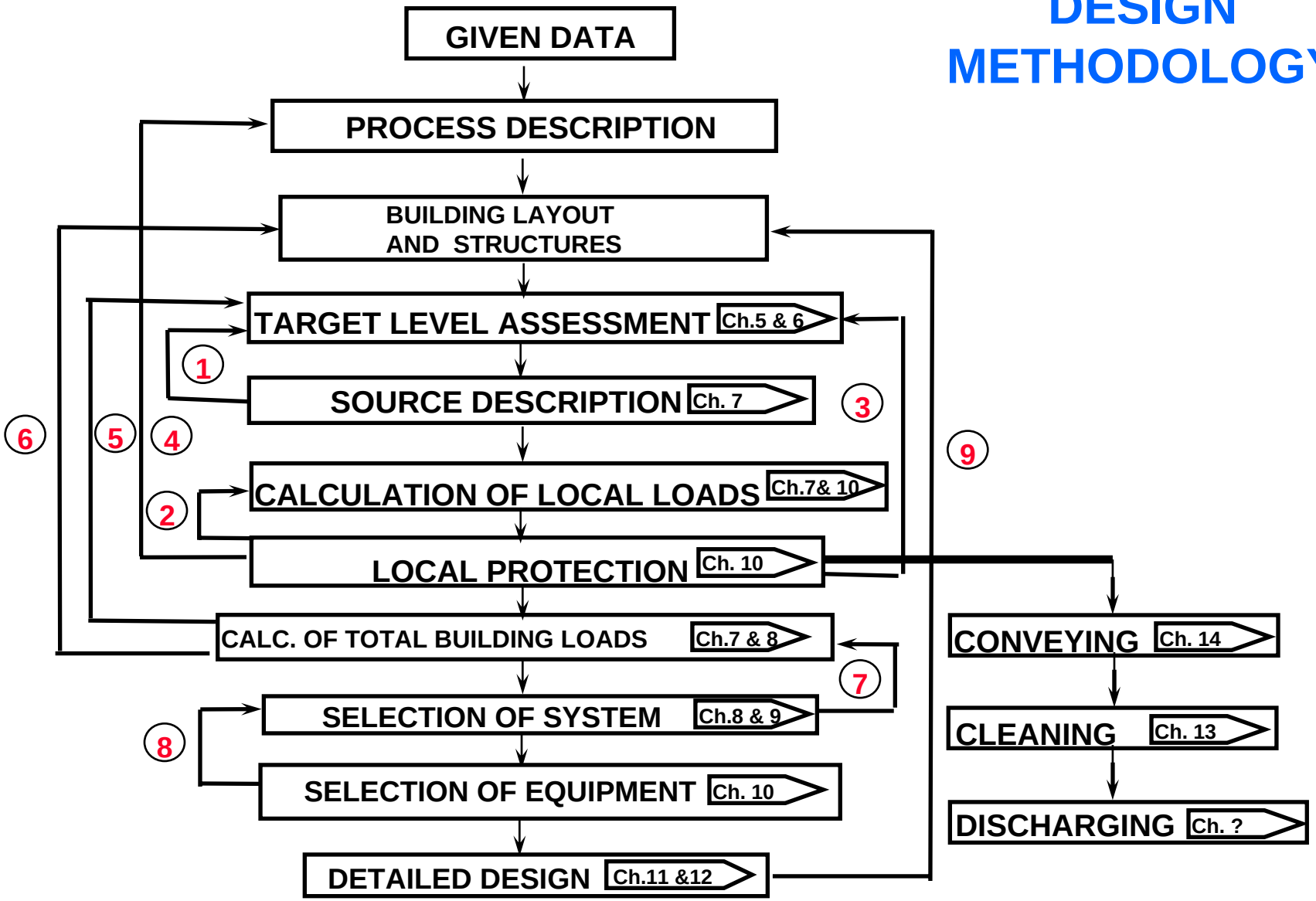
Why Target Levels

- A quantitative goal for Environmental conditions, such as
  - Industrial Air Quality
  - Thermal Environment
  - Noise Levels
- A target for Ventilation system performance
  - System Efficiency

DESIGN METHODOLOGY



TARGET LEVEL ASSESSMENT

MUST HAVES
ie Regulations, etc

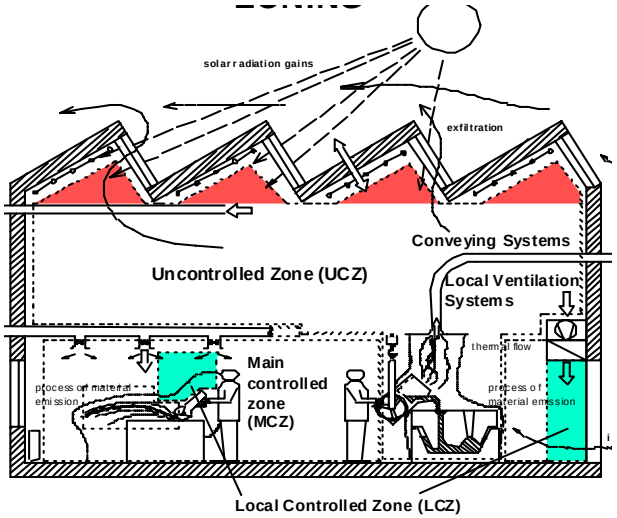
NEEDS
ie Human Comfort, etc

TARGET LEVELS

Main Zones | Local Zones | Exhaust | Ventilation

DESIGN CONDITIONS

RELIABILITY



Main steps in defining target levels

- **STEP 1: Musts**
  - Ascertain the requirements of laws, regulations, and standards related to legislation, processes, and equipment, and compare them with customer needs. Of course, before this step, needs of the end user - for example, economical boundary conditions - are identified.
  - At this stage the tentative target levels have also been selected.

- **STEP 2: Needs**
  - Ascertain nonbinding standards, human comfort standards, guidelines, codes of practice, and custom needs.

Main steps in defining target levels

- **STEP 3: Target levels**
  - Define the target levels based on musts and needs.

- **STEP 4: Desing conditions**
  - Suggest and confirm with customer the outdoor or process conditions within which the target levels must be met (e.g., absolute maximum temperature versus 95 percentile temperature).

- **STEP 5: Reliability**
  - Find out the customer reliability requirements of the process. Define and obtain the customer's acceptance oft he needs for ventilation system reliability (e.g., what is the allowed break-off time).

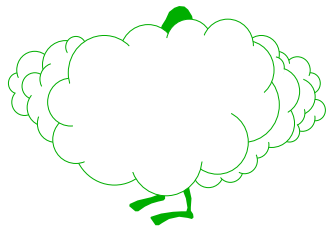
Target Levels for Industrial Air Quality

TLV is a minimum, but what should be the target ?

1,0 * TLV ——————————

0,5 * TLV - - - - - - - - - - -

0,1 * TLV - - - - - - - - - - -



0,01 * TLV - - - - - - - - - - -

Disadvantages of the TLV as a design criterion

- Based on concept of acceptable risk
  - A fraction of persons will have symptoms
- Revised at certain time intervals
  - Most often downwards,
    - e.g. Formaldehyde 1,2 > 0,37mg/m3 (ACGIH 1992)
- Defines an inappropriate contaminant level but not good and comfortable
- Even current concentrations in Industry generally below TLV

Mesured Concentrations in Industry Example, Xylene

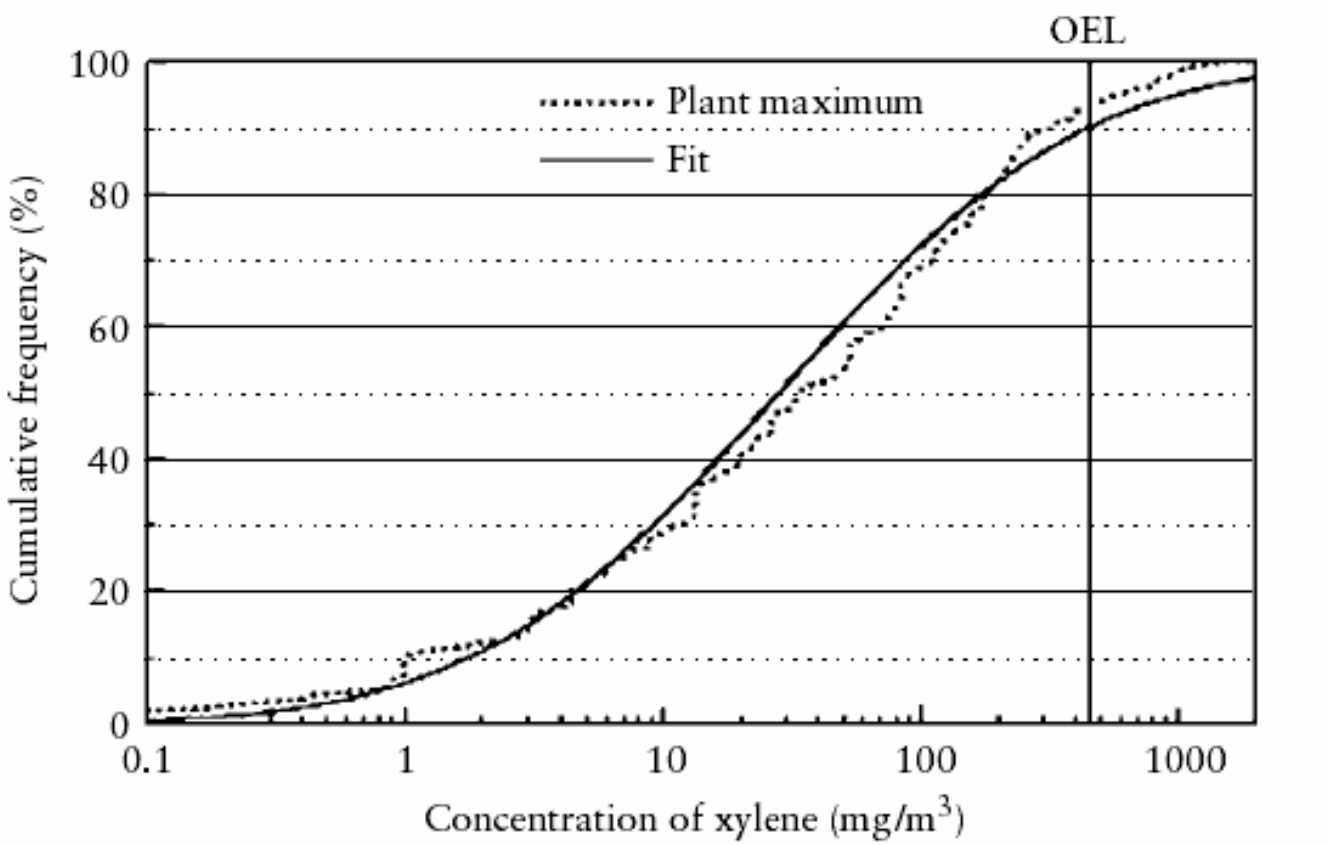
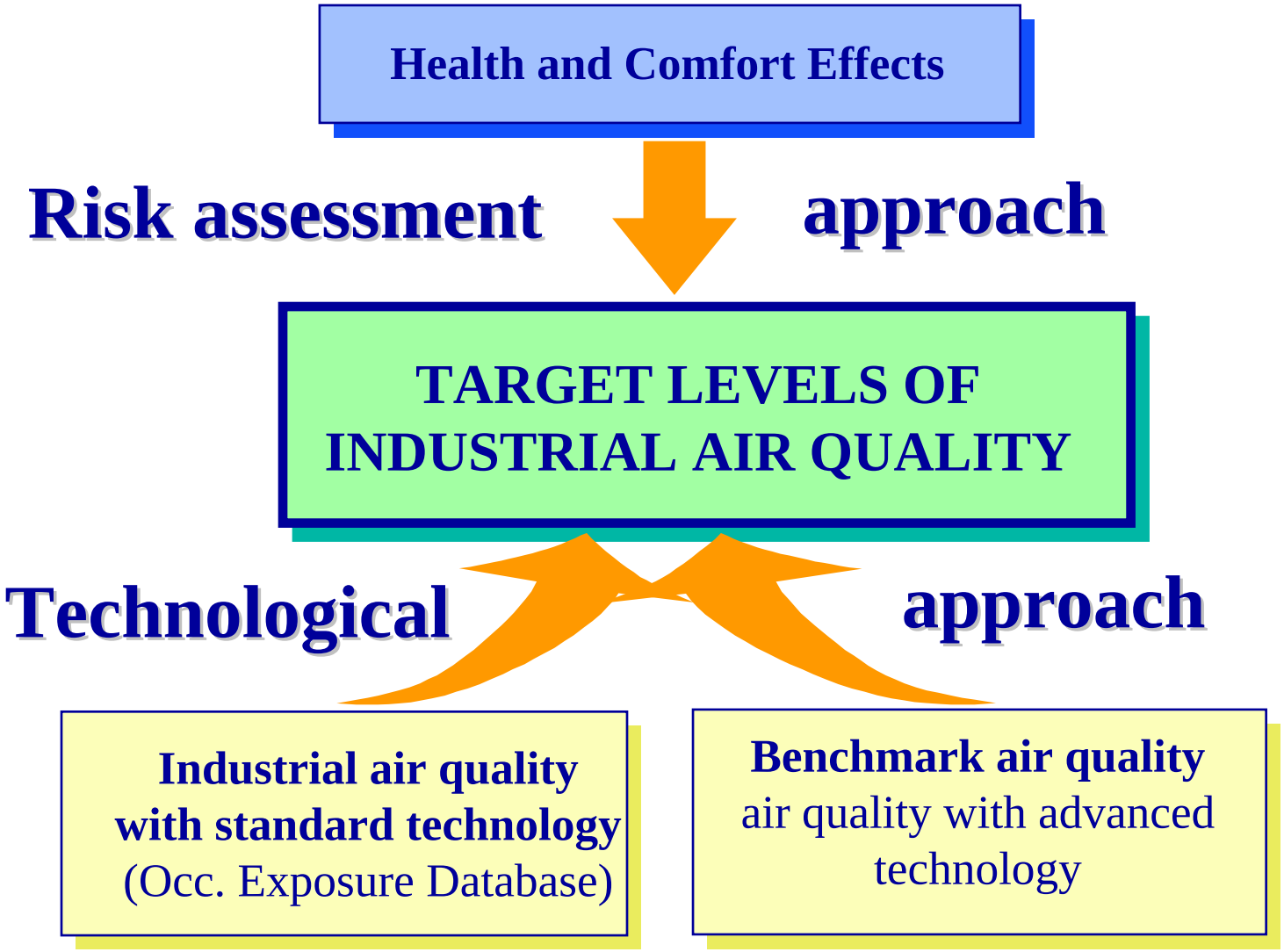
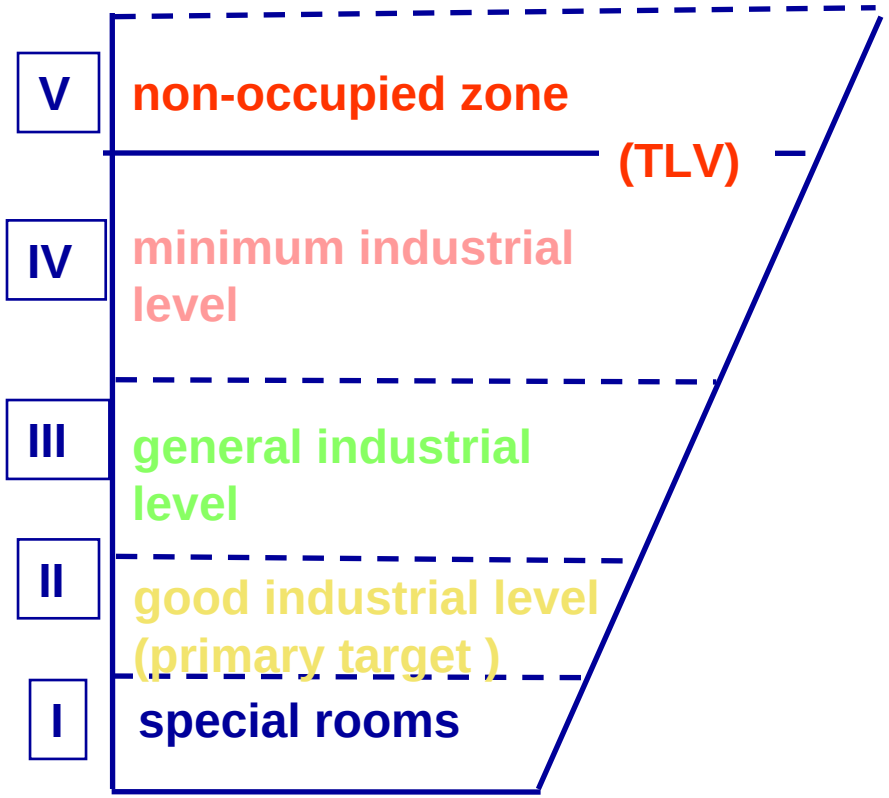


FIGURE 6.8 Plant maximum concentrations of xylene (number of plants = 139, number of measurements = 865).


Health and Comfort Effects
Risk assessment
approach
TARGET LEVELS OF INDUSTRIAL AIR QUALITY
Technological
approach
Industrial air quality with standard technology (Occ. Exposure Database)
Benchmark air quality air quality with advanced technology

Target levels of industrial air quality



Examples

	Formal-dehyde (mg/m³)	Hexavalent Chromium (µg/m³)	Toluene (mg/m³)
non-occupied zone (TLV)	0.37	50	190
minimum industrial level	**0.2** (54%)	**10** (20%)	**40** (21%)
good industrial level (primary target)	**0.1** (27%)	**2** (4%)	**5** (2.6%)

Summary,
Target Level (TL) based design approach

- The most critical or dominant contaminants of specific process are identified
- Achievable concentration levels are studied using Industrial databases and benchmarks
- The TLs are set for the predetermined concentration of a dominant contaminants
  - Not necessary to set targets for all existing contaminants
- TL is the target to be achieved by a control system
  - Verified during design, commissioning and usage

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Care for Indoor Air

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