QA/QC and NIS in Austria

WS on QA/QC in National Inventories
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A quality management system according to EN 45004 has been designed and implemented in 2003.

EN 45004 „General Criteria for the operation of various types of bodies performing inspection“: takes into account standards of the ISO 9000 series and goes beyond (ensures strict independence, impartiality and integrity).

Department for Air Emissions is seeking accreditation as inspection body in 2004/2005 (application has been made in June).
EN 45004 and requirements of GPG

Required according to GPG Chapter 8
Quality Manual

Three levels:

1. General (general information, description of QMS, responsibilities,...)
2. Detailed (checklists, SOPs,...)
3. Documentation of QC activities (filled out checklists,...)
Documentation, Archiving

- Archiving system for literature, mails, documents, calculations
- System for transparent documentation of inventory data and information (clear references, documentation of all assumptions made, recalculations, planned improvements, uncertainties,...) that allows reproduction of inventory

<table>
<thead>
<tr>
<th>Ref</th>
<th>Emissionfactor [g/Mg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>100</td>
</tr>
<tr>
<td>(1)</td>
<td>100</td>
</tr>
<tr>
<td>(2)</td>
<td>107</td>
</tr>
<tr>
<td>(3)</td>
<td>103</td>
</tr>
<tr>
<td>(3)</td>
<td>103</td>
</tr>
</tbody>
</table>

**Documentation:**

Emission factors

Ref (1): taken from Study [L001]
Ref (2): see calculation sheet [B001]
Ref (3): based on assumption that...
QA/QC Plan

Activities to be conducted written down in the Quality manual:

- QC Checklists
- Audits
- Documentation (Data, References, Communication,...)
- Plan of methodologies (needs approval from the formal contracting body)
- Inventory Improvement Plan: findings from Review documented with plan to improve inventory
- Country specific (CS) methodologies are defined in SOPs (need approval by head of inspection body)
- Procedure for sub-contracting
- ...

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Quality Control Activities (I)

- Performed by sector experts
- Once a year after inventory work has been finished
- Checks of formal aspects as well as aspects regarding contents (check of IPCC quality objectives TACCC)
- Checklists and electronic checks
- Checklists also cover Tier 2 QC
- Data provided by external institutions incorporated in QMS by sector experts
- QC activities proved to be helpful to identify errors as well as lack in transparency before inventory data is published
Quality Control Activities (II)

Checklists cover questions like:

- Are all references clearly made?
- Are all assumptions documented?
- Are the correct values used (check for transcription errors,..)?
- Check of calculations, units,…
- Is the data set complete for the whole time series?
- Check of plausibility of results (time-series, order of magnitude,…)
- Correct transformation/transcription into CRF
- Are all recalculations clearly explained?
- Is the data applicable?
- Where possible data is checked with data from other sources, order of magnitude checks,…
- ...

(following Table 8.1 of the GPG)
Quality Assurance

- Second party audits for CS methodologies, for key sources more detailed
- Second party audits for work performed by sub-contractors
- Accreditation audits (third party audits) check conformity of methodologies with requirements of IPCC GPG and EN 45004
- All audit findings including review findings are incorporated in the inventory improvement plan
Verification

- For some sectors (transport, f-gases, solvents)
- Mainly bottom-up/top-down verification
- Comparison of results from different approaches (civil aviation)
Resources for QA/QC and QMS

Development and implementation of QMS according to EN45004 until accreditation very time-consuming (plus fee for application for accreditation: 8 000 €)

Training: internal training for sector experts (two days per expert, additional time for trainer)

After implementation QA/QC procedures are integrated parts of inventory work, only little additional resources needed for audits and checklists (~5-10%)

Benefits outweigh additional efforts due to improved transparency and reproducibility
## Assessment on Transparency and Completeness

### Table 1: Transparency and completeness in submissions 2003 and 2004.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Submission 2003</th>
<th>Submission 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IE</td>
<td>NE</td>
</tr>
<tr>
<td>1 Energy</td>
<td>38</td>
<td>7</td>
</tr>
<tr>
<td>2 Industrial processes</td>
<td>13</td>
<td>59</td>
</tr>
<tr>
<td>3 Solvents</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4 Agriculture</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5 LUCF</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>6 Waste</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>61</td>
<td>90</td>
</tr>
</tbody>
</table>

### Calculation

Transparency was calculated as: \(1 - (\text{number of IE} / \text{number of estimates}) \times 100\)

Completeness was calculated as: \(1 - (\text{number of NE} / \text{number of estimates}) \times 100\)

*Taken from Austrian NIR 2004*
NIS Austria - NISA (I)

Degree of formalization, legal character
- Legal basis for inventory preparation „Umweltkontrollgesetz“
- Designation of one single entity with the overall responsibility for inventory preparation
- Confidential data can be obtained from public authorities
- Problem: no legal basis for collection of inventory data (operators are not generally obliged to report their emission data, reporting mainly on a voluntary basis) → additional legislation considered
Type of institutions involved

- Statistical office (on a contract basis)
- Umweltbundesamt is seeking cooperation with University
- Cooperation with federal provinces planned (bottom-up emission data)
- No process for consideration and approval of the inventory in place
Further questions:

- **Data Management?**
  MS Excel spreadsheets with Visual Basic Macros

- **Inventory Improvement Plan?**
  Compiled by sector experts (basis: findings from reviews, audits, comments from stakeholders,...)

- **Additional resources?**

- **Expert Judgements?**

- **Integration of QMS into NIS?**