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THE WORKING PARTY ON CHEMICALS, PESTICIDES AND BIOTECHNOLOGY**

Series on Pollutant Release and Transfer Registers No. 11

CONSIDERATIONS FOR ENSURING QUALITY PRTR DATA

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OECD Environment, Health and Safety Publications

Series on Pollutant Release and Transfer Registers

No. 11

Considerations for Ensuring Quality PRTR Data



INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS

A cooperative agreement among UNEP, ILO, FAO, WHO, UNIDO, UNITAR and OECD

**Environment Directorate
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
Paris 2008**

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PRTR Series No. 2: Proceedings of the OECD International Conference on Pollutant Release and Transfer Registers (PRTRs). PRTRs: National and Global Responsibility. Tokyo, 9-11 September 1998. Part 2 (1999).

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FOREWORD

At the April 2005 meeting of the Task Force on PRTRs, it was agreed that a data quality document should be developed and structured around best practices. After finalising the outline [ENV/JM/PRTR(2005)4], each country were invited to submit a paragraph that it wanted to highlight on each section of the approved outline. This proposal allowed the entire Task Force to contribute to the process and avoided the development of a “dry” manual that may otherwise result without full Task Force participation.

At the March 2006 meeting of the Task Force, Australia and the United States presented a draft data quality document [ENV/JM/PRTR(2006)4]. Participants welcomed the draft document, but did not yet consider the structure appropriate for a guidance document. In addition, it was pointed out that the validation section should be expanded and diffuse sources included. It was also proposed that the document have a special section for countries which are in the early phases of PRTR development.

Australia and the US presented a revised draft [ENV/JM/PRTR(2006)4/REV1] to the Task Force in February 2007. Participants welcomed the revised document, while indicating the areas which still were deficient, such as a glossary of terms, list of references and a special section for “countries which are in early phases of PRTR development.

This document provides the final report on “Considerations for Ensuring Quality PRTR Data”. It was reviewed and approved by the Task Force on PRTRs in March 2008. The Joint Meeting declassified the document in June 2008.

This document is published on the responsibility of the Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology.

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EXECUTIVE SUMMARY

Background

In recent years, the public's "right to know" has moved to the forefront of environmental policy making, and OECD is supporting governments' response by helping them develop databases of releases and transfers of pollutants and transfers of waste to the environment, called Pollutant Release and Transfer Registers (PRTRs).

This report provides a global overview and framework to quality PRTR information and activities from countries and organisations around the world.

At the April 2005 meeting of the Task Force on PRTRs, it was agreed that the data quality document should be structured around best practices and participating countries would be invited to submit information on the processes and systems that contribute to data quality. The information was collated by PRTR experts in Australia and the United States and this document "*Considerations for Ensuring Quality PRTR Data*" was produced.

Context

Considerations for Ensuring Quality PRTR Data intends to provide a "snapshot" of how OECD countries have developed and run their PRTR programmes. The aim is to provide information for existing government programmes, and also for countries who would like to develop a PRTR or improve their existing programme, and to give examples of different approaches in the development, implementation and improvement of PRTR programmes.

This document shows the similarities and differences across countries in their requirements to collect and display high quality data, which is required for an effective PRTR system. This document presents compliance and regulatory requirements, the development of guidance material, and emerging issues and challenges for the future.

Summary of the Content

Chapter 1 explains the scope of the document.

Chapter 2 explains data quality in the PRTR context.

Chapter 3 explains why data quality issues exist.

Chapter 4 provides information on the establishment of a PRTR system and the incorporation of data quality processes into the system.

Chapter 5 covers the importance of outreach activities on data quality, including the need for training and provision of guidance material.

Chapter 6 emphasises the importance of a structured data collection system and the role of reporting software in PRTRs.

Chapter 7 deals with data validation and error correction procedures. It covers the use of comparison models and other data validation software.

Chapter 8 looks at the role of stakeholders in using and contributing to quality data.

GLOSSARY OF TERMS

CEC	North American Commission for Environmental Cooperation (or NA-CEC)
CEPA	Canadian Environmental Protection Act
CLRTAP	Convention on Long-Range Transboundary Air Pollution
Co	Cobalt
DGRNE	Division de la Gestion des Ressources Naturelles et l'Environnement (Walloon)
EC	European Community
EEA	European Environment Agency
EET	Emission Estimation Techniques (Austarlia
EETM	Emission Estimation Technique Manuals (Australia)
eFDP	Electronic Facility Data Profile (US)
EMAS	European Community Eco-management and Audit Scheme
EMEP	Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air pollutants in Europe
EPER	European Pollutant Emission Register
EPCRA	Emergency Planning and Community Right-to-Know Act (US)
E-PRTR	European Pollutant Release and Transfer Register
FAQ	Frequently Asked Questions
FRS	Facility Registry System (US)
IMJV	Integrated environmental annual report (Flanders)
IPPC	Integrated Pollution Prevention and Control (An EC Directive
IWG	Implementation working group (Australia)
Mn	Manganese

MSC	Meteorological Synthesising Centre
NAICS	North American Industry Classification System
NEPM	National Environment Protection Measure (Australia)
NPI	National Pollutant Inventory (Australia)
NPRI	National Pollutant Release Inventory (Canada)
NRT	National Reporting Tool (Australia)
OECD	Organisation for Economic Co-operation and Development
OWNERS	One Window National Environmental Reporting System (Canada)
PAWN	Policy assessment of the water management in the Netherlands
PDR	Public Data Release (US)
PIEDC	Pollution Inventory Electronic Data Capture (UK)
PRTR	Pollutant release and Transfer Register
QA/QC	Quality assurance/quality control
RCRA	Resource Conservation and Recovery Act (US)
REGINE	Référentiel Environnement: Gestion Intégrée des Entreprises (Walloon) (Environmental Repository: Integrated Management of Enterprises)
Sb	Antimony
Th	Thorium
TNO	The Netherlands Organisation for Applied Scientific Research, a government sponsored research organisation
TOC	Total organic carbon
TRI	Toxics Release Inventory (US)
TRI-ME	The Toxics Release Inventory – Made Easy software (US)
UNECE	United Nations Economic Council
UNFCCC	United Nations Framework Convention on Climate Change
US EPA	United States Environmental Protection Agency
V	Vanadium
VMM	The Flemish Environment Agency (Vlaamse Milieumaatschappij)

CHAPTER 1: INTRODUCTION

1. The purpose of this paper, compiled by the OECD Task Force on Pollutant Release and Transfer Registers (PRTRs) is to outline the various aspects of ensuring that data reported in a PRTR is as high quality as practicable. This report is for use by PRTR Task Force members, member countries who are planning to develop or improve a PRTR, and users of PRTR data. The experience of member countries has been used to compile this report. Although member countries have always recognised the importance of quality assurance/quality control (QA/QC) procedures in their own management of PRTR data, there are new techniques and technological ways to make additional data quality improvements. This paper outlines these new techniques as well as details existing processes and procedures for QA/QC.
2. The OECD Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology has directed Task Force to continue to facilitate the sharing of PRTR data between countries, advance and improve the uses of PRTR data, identify, analyse and develop tools, and provide guidance in areas that promote the establishment of PRTRs in OECD member countries and beyond. The Task Force should also promote communication and a close working relationship between itself and other relevant organisations on the various aspects of PRTR work.
3. The scope of this paper is primarily on the reporting of emissions from point sources by individual companies or by facilities to air, land and/or water. While many PRTRs also include emissions from diffuse (non-point) sources (*e.g.*, motor vehicles) and transfers of waste, this paper does not explicitly address data quality issues for these data. It is assumed that many of the principles for improving data quality for emissions from point sources will apply to emissions from non-point sources and transfers of waste as well.
 - An exception is the method for comparing calculated emissions from pollutant transport modelling with measured concentrations in the environment. This method has been used for more than 25 years in the Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air pollutants in Europe (EMEP) where the reporting countries report air emissions for 28 substances on a 50x50 km grid to modelling agencies. These agencies, are the Meteorological Synthesising Centre (MSC) West in Oslo for the six macro pollutants and MSC East in Moscow for heavy metals and persistent organic pollutants. The calculated concentrations are compared with measurements in relevant locations. The reporting of emissions is supported by a guidebook giving default emission factors, prepared by expert panels for industrial as well as non-industrial sources. As described later in this report, this approach is also used in the Netherlands on a national, regional and even sometimes local level for air pollutants and with some modifications also for water pollutants.
4. Another important source of information on data quality is the United Nations Framework Convention on Climate Change (UNFCCC), where the protocols surrounding the reporting (*e.g.* for greenhouse gases) are very detailed and apply to all reporting countries.

5. Data quality and data assurance processes are integral to the usefulness and promotion of PRTR data. The big driver of improved data quality in Europe is the European PRTR which came into force in 2006, with 2007 as the first reporting year.

6. Member countries contributed their experience and knowledge of QA/QC to this report. The PRTR Task Force wishes to acknowledge the assistance of member countries and individuals in providing the content for this report.

CHAPTER 2: DEFINITION OF DATA QUALITY

7. The international conventions and organisations¹ set quality requirements to the release data, such as accuracy, comparability, completeness, consistency and transparency. The following elements, which are listed as indicators of these data quality objectives, are relevant also to PRTR data:

- Accuracy includes that the data does not include systematic over or under estimations and the uncertainty is as low as possible;
- Comparability includes elements such as a harmonised source nomenclature, standardised reporting formats, agreed estimation techniques and accepted methodologies and emission factors in production of the release data;
- Completeness includes all releases from the respective source are included in the reported data;
- Consistency includes unambiguous and uniform definitions, source identification and methodologies for the estimation of releases over several years to allow trend analysis; and
- Transparency includes information on how the data collection was performed, how the releases were measured or estimated, which methodology and emission factors were used to estimate releases and what are the units of the reported data (www.oecd.org/env/prtr/rc).

¹ See *e.g.* the following documents: IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories; EMEP/Corinair Emission Inventory Guidebook and European PRTR Guidance Document (www.oecd.org/env/prtr/rc).

CHAPTER 3: WHY DO DATA QUALITY ISSUES EXIST?

8. The quality of the data is an essential component of a PRTR so that conclusions drawn from PRTR data are appropriate and can be justified.

9. Although the control of data quality during its collection, storage, management, and dissemination is a challenge, it is one that is continuously being addressed by member countries.

10. Data quality issues may arise for many reasons, including the following:

- There may be uncertainties inherent in methodologies used for the release estimation and measurement of emissions from substances (www.oecd.org/env/prtr/rc);
- A complexity of reporting requirements may lead to different interpretations of the requirements, or to a lack of awareness or knowledge by industry on what and how to report;
- Not all pollutant release data are collected by PRTRs due to specific reporting requirements, thresholds, exemptions, or annual changes; these factors may affect the comprehensiveness of the data base, and the overall data quality; and
- There can be a lack of explanation of the limitations of PRTR data that could lead to difficulties when users interpret and analyse the data and draw conclusions about environmental performance.

11. The above issues may be relevant to improving the quality of PRTR data. Some of these issues relate to legislative requirements of PRTRs, while others can be addressed through improving processes and procedures for data quality.

CHAPTER 4: PRTR SYSTEM REQUIREMENTS

4.1 Establishment of a PRTR System

12. The PRTR is established by legislation in the European Union and in five countries (Canada, Japan, Mexico, Switzerland, Norway and the US); e.g. by a National Environment Protection Measure developed under the National Environment Protection Council Act 1994 in one country (Australia) and by Regulation [(EC) No 166/2006] in the European Union (comprising 27 member states). (This Regulation makes Member States report the necessary information to the European Commission in order to build a European Register, but it does not require each Member State to develop its own national PRTR Register). However, several Member States have already established their own PRTR (e.g. Denmark, Czech Republic, Belgium, the Netherlands, United Kingdom and Spain among others as detailed below) and more Member States will establish separate PRTRs in 2008-09.

13. Possibly the country with the longest history of PRTR reporting is the Netherlands as the development of an integrated PRTR covering emissions from all sources to air, land and water started in 1974. At that time there were no legal obligations for companies to report, rather it was the result of negotiation with companies that their data, together with data from other non-industrial sources, would be reported. In 1985 a substance directed policy was developed. In 1999 it was decided to introduce a legal obligation for the larger companies to report their emissions directly to the permitting authorities (provinces, water boards and municipalities) who would also have the responsibility for quality and completeness of the data.

14. The Canadian PRTR (known as the National Pollutant Release Inventory, NPRI) was developed through a multi-stakeholder consultation process, with the first year of reporting for 1993. Authority for the NPRI is provided by Section 46 of the Canadian Environmental Protection Act, 1999 (CEPA 1999). Specific reporting requirements are outlined annually in an annual Notice in the Canada Gazette.

15. The PRTR system of Japan is established by a law ("Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof"). The purpose of this law is to promote voluntary improvements in the management of specific chemical substances by businesses and to prevent any impediment to environmental protection, with the system of PRTR and Material Safety Data Sheets.

16. The US PRTR, known as the Toxics Release Inventory or "TRI", was established under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986.

17. The UK Environment Agency Pollution Inventory (PI) has been in operation since 1998, covering England and Wales only. Currently, the Environment Agency uses powers under the Pollution Prevention and Control (England and Wales) Regulations of 2000 (as amended) and, in particular, a legal notice under Regulation 28, as the framework for the collection of pollutant emissions from the industrial activities it regulates. Following data submission to the Environment Agency, data is then assessed to ensure completeness, consistency and credibility. The process and timetable for this is detailed in a formal

procedure within the Environment Agency's overarching Management System and various guidance documents.

18. Australia's PRTR, known as the National Pollutant Inventory (NPI), utilises a National Environment Protection Measure (NEPM), as varied August 2007, as the framework for the collection and dissemination of emissions data in Australia. The NEPM is an instrument given legislative mandate by the *National Environment Protection Council Act* of 1999 and enacted in each state and territory through regulation. Data quality is part of the NPI NEPM requirements (clauses 16, 17, and 18). These clauses require the states and territories to ensure data quality through powers respective to their relevant jurisdiction. The legislation within each jurisdiction varies, and some, such as the State of Western Australia and the State of Queensland, contain provisions to penalise reporters in the event that late, false, or misleading data is reported.

19. The European PRTR Regulation establishes an integrated PRTR in the form of a publicly accessible electronic database and lays down rules for its functioning. All Member States collect data from industrial facilities and report national datasets annually to the European Commission/European Environment Agency (EEA), which publishes them on the Internet.

20. The right to environmental information was laid down in Article § 110 b of the Constitution of the Kingdom of Norway in 1992. A new regulation on the Right of access to environmental information held by public authorities and private actors and of participation in public decision-making was submitted to the Ministry of the Environment on 19 December 2000. The purpose of this Act is to ensure that every individual has easy access to environmental information for the sake of the individual, the environment and the possibility of participating in public decision-making processes.

21. Under the Norwegian Pollution Control Act industrial pollution is forbidden. The Act gives the pollution control authorities (national and regional) the right to issue discharge permits for polluting activities. Any industry or enterprise that may cause pollution has to apply for such a permit. A permit normally lays down restrictions on the release of hazardous substances to air and water as well as restrictions on production volumes. In addition to these restrictions the permit also specifies certain requirements. One of these duties is to produce an annual report to the pollution control authorities (national and regional – SFT/county).

22. In Spain, the establishment of the PRTR, known as The Spanish Register of Emissions and Pollutant Sources, PRTR-España, is guaranteed by Real Decreto 508/2007 that complements the European regulation with certain features that increase coherence with other inventories of emissions to air, water and wastes. Besides, Spain will meet its obligations within the framework of the European Union by sending all relevant information as requested by Regulation (EC) 166/2006 within the appropriate deadlines.

23. Since the implementation of EPER in Spain and also in the PRTR-España, industrial facilities affected are asked to deliver all information available, although only data above the corresponding thresholds (established at first in the EPER Decision and now in Regulation (EC) 166/2006) are public.

24. PRTRs established by legislation are in effect mandatory instruments. Where data quality requirements are specified in the mandatory instruments, the expectation is that data quality would be of a higher standard in terms of completeness, consistency, comparability and transparency. For non-mandatory systems, other elements of data quality (such as accuracy) could actually be better than for mandatory systems, because reporting facilities would be expected to be willing participants of the program and therefore interested in the credibility of the program. However, the lack of potential penalties for facilities that under-report or commit other infractions could outweigh this factor. The lack of

published information on the differences in data quality between mandatory and non-mandatory systems is a gap in this analysis.

4.2 Who is required to report?

25. For each of the PRTR systems, reporters or operators of a facility or a business are required to report emissions to the competent authority, provided they meet threshold requirements.

26. In Canada, owners or operators of facilities that manufacture, process or otherwise use one or more of the NPRI-listed substances under prescribed conditions are required to report. The current requirements for reporting to the NPRI are summarized below.

- In general, reporting to NPRI is required of all facilities at which employees worked a total of 20 000 hours or more during the reporting year (the “employee threshold”), unless the facility is part of an exempt sector (for example, education, retail sale, fishing and agriculture). The employee threshold does not apply for certain specified sectors subject to NPRI reporting (such as waste incinerators and wood preservers), in order to capture reporting from smaller facilities that would be expected to release significant quantities of NPRI substances;
- If a facility meets the above requirements, it must then determine whether it meets the “substance thresholds” for each NPRI substance;
- In general, if a facility manufactures, processes, or otherwise uses 10 tonnes or more of an NPRI substance at greater than 1% concentration, it must report the quantities of that substance released to air, water, and land, disposed of, and sent for recycling. The substance threshold is reduced for priority substances such as mercury (5kg) and lead (50kg); and
- For the air pollutants that contribute to smog and acid rain, the threshold for reporting is release-based. For example, a report must be filed for sulphur dioxide if more than 20 tonnes are released to air in a particular year.

27. The Japanese PRTR system has reporting requirements for specific industry sectors, with additional criteria based on the number of employees of a business and the amount of chemicals handled by each facility.

28. Each year, facilities in the United States that meet certain thresholds must report their disposal or other releases and other waste management activities (i.e., recycling, energy recovery and treatment) for listed toxic chemicals to the US Environmental Protection Agency (EPA) and to the state or tribal entity in whose jurisdiction the facility is located. A facility must report to TRI if it:

- Operates within a North American Industry Classification System (NAICS) code that correlates to any of the following industry sectors:
 - Manufacturing (SIC codes 20-39);
 - Metal mining (SIC code 10, except 1011, 1081, and 1094);
 - Coal mining (SIC code 12, except 1241);
 - Electrical utilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce (SIC codes 4911, 4931, and 4939);
 - Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste treatment and disposal facilities (in SIC code 4953);
 - Chemical wholesalers (SIC code 5169);

- Petroleum terminals and bulk stations (SIC code 5171);
- Solvent recovery services (SIC code 7389); and
- A federal facility in any SIC code;
- Employs with 10 or more full-time-equivalent employees; and
- Manufactures or processes using more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year, except for PBT chemicals where the thresholds are 0.1 gram for dioxin and dioxin-like compounds, and 10 or 100 pounds for other PBT chemicals.

29. In Australia's PRTR system, facilities must report if they trigger certain thresholds of use of NPI substances or the amount of energy consumed in a year. A comprehensive guide is provided to reporters to assist them to determine which, if any, thresholds are exceeded and the substances which therefore need to be reported. Once a reporting threshold is exceeded, emissions from all sources on site of that substance need to be reported (e.g. if a fuel burning threshold is exceeded, emissions of reportable substances from non-fuel burning sources also need to be included). The thresholds are:

- Use of more than 10 tonnes of any Category 1 substance, 25 tonnes of a Category 1a substance or 5kg of a category 1b substance per year;
- Burning more than 400 tonnes of fuel or consuming more than 60 000 megawatts of electricity per year or burning more than 1 tonne per hour of waste or fuel; and
- Emitting or transferring more than 15 tonnes of total nitrogen or 3 tonnes or more of total phosphorus to water in a year (excluding emissions to groundwater).

30. For the European Union's E-PRTR (Article 5 of the Regulation), the operator of each facility that undertakes one or more of 65 different activities above certain capacity thresholds reports every year the annual amounts to its competent authority of the following:

- Releases to air, water and land of 91 pollutants for which the release threshold is exceeded;
- Off-site transfers of pollutants in waste water, for which the emission threshold is exceeded; and
- Off-site transfers of hazardous waste exceeding 2 tonnes per year or of non-hazardous waste exceeding 2 000 tonnes per year. The report indicates whether the waste is destined for recovery (R) or disposal (D) and, for transboundary movements of hazardous waste, the name and address of the recoverer or the disposer of the waste and the actual recovery or disposal site.

31. The European Commission, assisted by the European Environment Agency, shall additionally include in the E-PRTR information on releases from diffuse (non-point) sources where such information exists and has already been reported by the member states. This especially concerns releases from transport (road, shipping, aviation and railway), military, domestic fuel combustion, solvent use, fossil fuel distribution, roofing and road paving with asphalt, agriculture, natural background losses, and scattered dwellings.

32. Belgium has recognised the importance of lowering the burden and costs for companies and administration of multiple reporting requirements. Under the initiative of their respective administrations, in 2003, the Walloon and Flemish region has implemented an ambitious approach to rationalise and simplify environment-related regulatory monitoring and reporting requirements. Brussels has started a

similar approach in 2007. Around 300 industrial companies in Walloon and 15 000 in Flanders are affected. Among them around 200 and 600 companies respectively in the Walloon and Flemish regions are concerned with PRTR reporting. In Brussels 10 companies have been identified.

33. The Walloon region has created an Environmental Integrated Survey and REGINE (Référentiel Environnement: Gestion Intégrée des Entreprises – Environmental Repository: Integrated Management of Enterprises) to collect all relevant data and information. A similar system called "Integrated environmental annual report (IMJV) has been introduced in 2006 in Flanders. Those single data sources are then available among different services and administrations ensuring at the same time the confidentiality of certain data. The survey not only integrates a maximum of information, but also optimises the work for companies and the relevance of collected data due to a personalisation and pre-filling of the questionnaire according to the company's profile and the regulatory requirements. The survey is entered on-line.

34. The main principle of pollution control in Norway is that a polluter must have a detailed understanding of any pollutant released into the environment. This knowledge is mandatory, and releases of any significance must be reported to the authorities. Everyone that has a permit has to report their emission of significance. The reporting format is standard.

35. In Spain, besides all substances included in Regulation (EC) 166/2006, additional information is required through Real Decreto 508/2007. This additional information includes 7 more substances to air (Total Suspended Particles, Th, Sb, Co, Mn, V and also TOC) and 18 more substances to water (most of them isomers of substances included in Regulation (EC) 166/2006). Information regarding other environmental items such as permit conditions is also required. This request of additional information tries to enhance coherence between the Spanish PRTR and other Spanish inventories of emissions to air, water or wastes.

4.3 Specifying Estimation of Emissions

36. The method of determining the releases and off-site transfers of point sources estimating the emissions for the European PRTR is based on measurement, calculation or estimation that has to be specified for every annual amount of release or offsite transfer. In the case of data indicated as being based on measurement and calculation, the method for measurement or calculation is reported. It must be in accordance with internationally approved methodologies, where these are available. These "internationally approved methodologies" are listed in the Guidance document for implementation of the European PRTR. Equivalent methodologies according to the Guidance document could be used by the facilities.

37. Australia, the US, Canada, and Japan all allow the estimation of emissions using a choice of techniques, many of which are common to all four PRTRs. For example, Australia's guidance material gives a reporter the choice of using: measurement, mass balance, estimation using emission factors, engineering calculations or another method approved by the authority to which they report.

38. The Netherlands and Australia provide default emission factors in guidance material for companies while the Netherlands also provides standard composition profiles for calculations of emissions for substances usually not in the standard measurement programme. The use of default emission factors from literature or from experience is a tool that can be used in the early stages of the development of a PRTR. In the electronic reporting that is now widely used, several tools are incorporated like default emission factors or standard composition profiles for situations where no measurements are available. The companies are not obliged to use them if they have valid reasons for not doing so.

39. For the Netherlands, the electronic reporting tools developed for companies use many of these default emission factors. A company may overrule them if they have better data or reasons to suppose that

the default emission factor is not relevant. An example is coal firing which should emit heavy metals, however, the amount emitted is dependent on the coal used.

40. In Australia, the industry reporting materials (usually in the form of Emission Estimation Technique Manuals (EETM, commonly referred to as guidance material) must be available for each industry sector that is potentially required to report to the NPI. The guidance materials consist of a mixture of emission estimation techniques (EETs) of excellent quality (highly researched and validated) combined with EETs based on default factors which may have extremely poor relevance to reality and site activities (e.g. in some circumstances PM10 and metals in dust), but nonetheless provide the only cost-effective methodology for emissions estimation. Australia is in the process of incorporating emission factors into calculation tools for each industry sector. This will enable most emission estimations to be carried out in a consistent manner and so improve data quality when these tools are incorporated into an improved reporting system. In addition, Australia has commenced a major programme of updating guidance material to capture changes in technology in industry sectors and to update emission factors for Australian conditions. Where available, the provision of up to date emission factors is expected to lead to improved data quality over the next few years.

41. The experience in the Netherlands is that the use of default emission factors, when combined with electronic reporting, is very useful in improving data quality. On the international level, a process of adapting the UNECE Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) Atmospheric Emission Inventory guidebook has started. This activity should improve the reporting of heavy metals to the Long Range Transport of Air Pollutants Convention.

42. The UK's Pollution Inventory emissions data, currently for releases to air, water, sewer and wastes transferred off-site for disposal or recovery, are reported annually as a mass emission from individual sites if greater than a specified threshold. The method by which the emissions data have been determined must also be provided, that is by measurement, calculation or by estimation.

43. Releases for the Japan PRTR are calculated by either: direct measurement, mass balance, emission factors or engineering calculations by physical properties or by other appropriate methods. Guidance which explains these estimation methods and on-line software for the estimation of releases and transfers for reporters is provided in either book form or on websites (manual - <http://www.env.go.jp/en/chemi/prtr/manual/index.html>; on-site software only in Japanese - <http://www.prtr-info.jp/prtr/index.html>).

44. In the US TRI, the legislation provides that for each release and transfer estimate, reporters are required to indicate the principal method used to determine the amount reported. Historically the four methods identified for TRI reporting were: monitoring data or measurements; mass balance calculations; emission factors; and engineering calculations or best engineering judgment. The US has recently expanded the methods identified for TRI reporting, they are: continuous monitoring; periodic/random monitoring; mass balance calculations; published emissions factors; site-specific emission factors; and engineering calculations or best engineering judgment. Collecting more specific "basis of estimate" data will help the TRI Program determine which methods are most often used and/or appropriate for use by particular industries for certain chemicals, as well as when new TRI guidance may be needed.

45. In Canada, guidance which explains various approaches to estimating releases is provided for certain industry sectors, along with more general case studies and on-line estimation tools to assist reporters. Although the NPRI does not currently have the authority to require the use of specific estimation techniques, many facilities are required under other federal or provincial regulation to use specific

measurement techniques to estimate releases. The data that results are generally then used to complete the NPRI report. Under NPRI, the facility is required to specify which technique was used to estimate releases.

46. Facilities in Norway shall measure, calculate or estimate their emissions. This has to be specified for every annual amount of release for each substance. As a duty in the permits the facilities shall use Norwegian Standards when measuring or calculating, if this standards are available. The Norwegian standards are often the same as EU-standard or international standards.

47. To the Spanish PRTR register, as already to the EPER, besides the emission data, in kg/year, also the method and, when appropriate, the standards used to determine them by measurements, calculations or estimations must be reported. Environmental permit (IPPC and other) usually includes the requirement not only on monitoring but also on how to determine emission data.

48. In summary, the specification of emissions estimations, as either estimation or measurement, encourages consistency of reporting methodologies by facilities and therefore consistency of the data. It is not always possible to compare measured and estimated emissions information, but if users of PRTR data understand that comparability of data is not always possible, it will assist in interpretation of data.

4.4 Responsibility for Data Quality

49. In most PRTR systems, the quality of the emissions data is the responsibility of the reporters or businesses and a variety of means is used to formalise this responsibility. For example, although the Canadian law does not identify specific data quality requirements per se, the Notice to Reporters specifies that: "The information reported shall be based on the best available data and information that the person possesses or to which the person may reasonably be expected to have access."

50. For the Canadian and the Australian PRTRs, an authorized person must sign a "statement of certification" indicating that the person has reviewed the documents, has exercised due diligence to ensure that the information submitted is true, accurate, and complete.

51. The quality of emissions data in the UK Pollution Inventory is the responsibility of the operator. Regarding the formalisation of this, currently only the paper form requires the operator to sign a "declaration", that reads "I declare that the information provided in this form is correct, to the best of my knowledge and belief."

52. The US TRI provides for the publication of a uniform toxic chemical release form that includes "an appropriate certification, signed by a senior official with management responsibility for the person or persons completing the report, regarding the accuracy and completeness of the report." The certifying official must sign a certification that states the following:

"I hereby certify that I have reviewed the attached documents and that, to the best of my knowledge and belief, the submitted information is true and complete and that the amounts and values in this report are accurate based on reasonable estimates using data available to the preparers of this report."

53. In addition, the US statute states the following:

"The owner or operator of a facility may use readily available data (including monitoring data) collected pursuant to other provisions of law, or, where such data are not readily available, reasonable estimates of the amounts involved. Nothing in this section requires the monitoring or measurement of the quantities, concentration, or frequency of any toxic chemical released into the

environment beyond that monitoring and measurement required under other provisions of law or regulation.”

54. In Japan's PRTR system, the business operator must sign a notification form that guarantees quality. A civil fine is imposed on businesses that fail to submit reports pursuant to the provision or that submit false notifications.

55. The European PRTR requires operators to ensure the quality of the information that they report, which is afterwards assessed by the competent authorities to ensure the completeness, consistency, and credibility of the data (article 9 of the Regulation). The Member States of the European Union lay down the rules on penalties applicable to infringements of the provisions of the European PRTR Regulation and take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive.

56. Facilities in Norway are responsible for the data they are reporting, including the quality of the data. Up to now, the data have been reported on a paper format. The year 2007 was the first year of electronic reporting. In the electronic format there are some automatic checks on the data that the facilities are reporting. In addition the authorities are doing some quality checks of the data. This includes: i) Comparing emissions with the data reported during the previous year; ii) Comparing the emissions with the production volumes; and iii) Comparing the emissions with other available information on the industry. If the reporter does not deliver the report, they will get a reminder with a final deadline for reporting. The facilities that don't report by the deadline will get a fine (a certain amount per day) until the report is received by the authorities.

4.5 Establishment of Quality Systems for PRTR Data

57. Establishing quality systems and guidance is not only important for PRTR reporting but also for raising awareness and capacity of industries to report to a PRTR.

58. Between 1974 and 1983 in the Netherlands, about 8 000 companies were visited by experts from the organisation TNO (The Netherlands Organisation for Applied Scientific Research, a government sponsored research organisation) who took care of quality and completeness of the provided data (6 000 had relevant emissions). After that, the 1 500 (later 700) most polluting facilities were selected for yearly reporting with a ranking system based on toxicity information for individual substances. The extensive material on emissions and emission factors was evaluated and extended by consultants in close cooperation with the industrial experts. The reports, finalised in 1995, resulted in process descriptions and emission factors to air, water solid waste and energy use factors for about 160 different branches of industry. The material from this period is still used as one of the tools for controlling quality and completeness of reported data. Summaries in English of methods and emission factors will probably be connected to the UNITAR virtual classroom. More recent material can be found on the website of the PRTR. (See www.emissieregistratie.nl)

59. However, there are still a number of challenges for the Netherlands' system for PRTR reporting. The relationship between the permits and the central PRTR database has never been very strong. Also the development of emissions trading contains quality requirements that in most cases are more rigorous than those necessary for PRTR reporting. Integrating the emissions trading information with the PRTR data is also a challenge.

60. More recently, the Flemish Environment Agency (Vlaamse Milieumaatschappij, VMM) conducted a study to implement a quality system for the emission inventory of greenhouse gases (GHG). The system was established in May 2004, with the complete development of the system and an internal review

conducted in 2005, with full implementation for all sectors expected during 2006. For the Walloon region, an "audite" of the administration (DGRNE) in charge of the GHG emission inventory had been performed prior to the establishment of a similar quality system.

61. The VMM also conducted a study to calculate the uncertainties of the GHG inventory in Flanders. A first estimate was made by an independent consultant (Det Norske Veritas) under the authority of VMM. The results are available in the technical report "Quantification of Uncertainties – Emission Inventory of Greenhouse Gases of the Flemish Region" June 2004. Some adjustments were made following consultation among the three regions of Belgium in 2004/2005. The quality system set up in Flanders is based on the ISO standard 9001:2000. For the Walloon Region, the uncertainties calculation is performed by the administration in compliance with the IPCC guidelines.

62. During development of the quality management system in Flanders, a gap analysis is carried out, and a quality structure and different standardized procedures established. A quality handbook is published which includes all aspects of a technical and organizational level to set up the emission inventory of GHG.

63. The QA/QC work that has already been carried out for the greenhouse gas emission inventory will be the basis for the future implementation of a quality assurance and control system for the air pollutants covered by the PRTR programme.

64. The control unit at the Norwegian authorities can review a facility's annual report at any time. This review could take the form of an inspection or an audit. This means that people from the authorities are visiting the facilities and are able to go deeply into the documentation for the data that are reported. This can be regarded as a quality check.

65. Each year, a committee of the Japanese government reviews the estimation of releases outside of notifications and the methods of estimation, for which public comment is invited.

4.6 Compliance and Enforcement Procedures

66. Competent authorities may undertake inspections of facilities to check whether data are being reported accurately. Such inspections may be scheduled on a regular basis or they may be carried out on a sector by sector basis.

- Inspections of companies can lead to improved data quality. For example, during the Canadian NPRI's quality control checks, a particular facility was identified as reporting questionable data that was very large in magnitude. Although the questionable data was flagged to the facility on numerous occasions, the data were repeatedly confirmed as correct by the facility. Eventually, the decision was made to perform an on-site inspection to verify the reported information. This inspection revealed that the large reports were, as suspected, due to errors by the facility. The facility subsequently updated their reported information. The inspection is expected to significantly improve data quality in the future from that facility primarily because the facility's reporting methodologies were reviewed by and discussed with officials from the NPRI and Environment Canada's Enforcement Branch.

67. Competent authorities may undertake enforcement actions which can also result in improved data quality.

- In Australia, the NPI is a cross jurisdictional programme and has an implementation working group (IWG) which brings together experienced NPI practitioners to discuss and solve technical, policy and administrative issues, leading to ongoing improvement in emission estimation

techniques and the NPI Programme. The comprehensiveness and quality of the dataset improves if reporting is supported by an effective program of enforcement action. For example, in 2006 the State of Queensland initiated compliance action against 73 non-compliant facilities. This resulted in all but one providing the necessary information in a timely fashion. This allowed comprehensive data quality checks to be performed prior to the publication of the data.

CHAPTER 5: EFFECTS OF OUTREACH ACTIVITIES ON DATA QUALITY

5.1 Training and Outreach for Reporters at the Early Stages of a PRTR

68. In the initial stages of PRTR development it is important to provide training and outreach to potential reporting facilities, in particular on appropriate methods of release estimation. Many countries have undertaken such activities – an example from the Netherlands is shown below.

69. The Netherlands offered practical advice and training to companies, especially in the start-up phase of the PRTR programme. Two examples follow.

Measurements at the site level

- Many facilities only measured on a regular basis the substances mentioned in the permits. In many cases, especially for the water compartment, only concentrations were measured which for the sake of reporting emissions were multiplied by some mean volume flow. With fluctuating processes the data produced by this approach have a low quality. Also micro pollutants present in, for instance, coal are often not measured. TNO developed a toolbox containing standard concentration profiles for enabling the user to make at least an estimation of the amount of these substances emitted. Some of the companies incorporated these tools into their own environmental management system. The electronic reporting system that is now operational contains also several of these tools.

Mass balance over a production site

- Determining a mass balance over a company is a very useful quality control tool that was extensively used by the TNO when they did data collection for the PRTR programme. The problem is that it only works if emissions data from the different environments, air land and water, are available and where data about the input of basic material and analyses of the contents of sold products are also available. This requires good communication between the different operations within a company. If the reporting by the company is done by an administrative department of the company, the technical discussion does not necessarily happen.
- An illustration is that a very efficient wet scrubber was installed in a factory significantly reducing emissions to air with the water from the scrubber going to the wastewater treatment plant. As aeration is a very good stripping method, the volatiles were not emitted from the chimney but rather from the wastewater treatment plant. There have been many cases where the companies were not aware of these unexpected secondary emissions unless a mass balance was done.
- Another example was a large basic metal production plant where, from the mass balance, it could be concluded that there should be a rather large emission of arsenic somewhere. It

appeared to be part of the wastewater stream where arsenic was not even part of the measurement programme.

5.2 Training and Outreach for Reporters at Later Stages of PRTR Development

70. Training and outreach to reporters not only improve understanding of PRTR reporting requirements but also allow a dialogue with reporters that can include the need for data of good quality. Some examples of training and outreach from some member countries are given in this section.

71. Canada provides information sessions for reporters across the country, which increase understanding of the reporting requirements and highlight any changes from previous years. In addition, a variety of other guidance materials, tools, calculators, case studies and supporting information are available on the NPRI website to assist reporters. Canada also offers a help desk by phone or on-line.

72. Additionally, Canada has recently initiated a collaborative process between government and representatives from individual industry sectors. Collaboration on better defining and quantifying releases from specific industrial processes, as well as protocols for application of consistent estimation methodologies within a sector, are two areas of focus that are expected to be very beneficial in meeting Canadian goals of improving data quality and consistency.

73. The TRI programme in the United States has offered in-person and on-line training workshops for prospective reporters for many years. Similar workshops are now available over the Internet. In addition, each US EPA Regional Office has a TRI coordinator who conducts training classes and workshops, often in conjunction with associated state and tribal programmes. The US also offers assistance by phone and through a frequently asked questions service available on-line.

74. In Australia, there are no requirements in the NPI NEPM specifically relating to reporter outreach. However, the states and territories have identified that the provision of training and support (in various forms) is essential in improving the quality of submitted data. Activities include facilitating workshops in different areas (e.g., in the State of Queensland) and all agencies rely on telephone and email contact with reporters as a major way of improving data quality. Training in Australia has also been delivered in partnership by state governments and educational establishments. For example “*Cleaning up with the NPI, a course in professional practice*”, was presented by Griffith University and the Queensland Environment Protection Agency during 2005.

5.3 Guidance Documents

75. The development of technical guidance documents has been a major aspect of the OECD PRTR Task Force’s work over the past decade and many documents are available on the OECD Resource Centre (<http://oecd.org/env/prtr/rc>) including the Framework for Selecting and Applying PRTR Release Estimation Techniques.

76. The Australian Government is required to produce industry reporting materials before an industry sector is required to report and these materials, which consist of the NPI Guide and specific Emissions Estimation Technique Manuals, are available on the NPI website for reporters. There is guidance for each of the 90 industry sectors as well as separate guidance for diffuse data emissions estimations.

77. The European Commission also provides a guidance document for reporters and competent authorities. The guidance document addresses, in particular, the reporting procedures, the data to be collected and includes the “internationally approved methodologies” for implementation of the European PRTR.

78. The Norwegian Pollution Control Authority provides a guidance document for the reporters. This document should help the facilities to fill in the report.

79. The United States TRI Programme has developed more than 30 guidance documents to assist facilities in complying with the TRI regulations. The industry- specific and chemical-specific guidance documents provide details on how reasonable estimates can be made for purposes of fulfilling the reporting requirements. In addition, the Programme also provides a document called the “Toxic Chemical Release Inventory Reporting Forms and Instructions” that provides a step-by-step explanation of how to complete the TRI forms. It provides a wealth of technical and non-technical information designed to minimize reporting errors. This document is updated annually, and is available electronically over the Internet. (See http://www.epa.gov/tri/guide_docs/index.htm).

80. Canada provides a variety of guidance materials to reporters. Along with guidance incorporated into the online reporting system, an overall guide to the reporting requirements is produced each year, answers to commonly asked interpretation questions are posted, and sector-specific guidance is developed when needed to facilitate improved reporting.

81. In Japan, a variety of guidance materials and Frequently Asked Questions (FAQs) are provided in book form and on websites for the convenience of the reporters. For the competent authorities, the manuals for PRTR processing systems are provided in order to promote the efficiency of office work.

82. In Spain guidance documents on how to fulfil their PRTR obligations have been developed both by authorities and by some industrial sectors (*e.g.* cement, pig and poultry farm, pulp and paper, glass, fused metal coating sectors). The Spanish Environmental Ministry supports any initiative of this kind. These documents are available in www.prtr-es.es and also on regional governments’ web sites

5.4 Effectiveness of Outreach Activities

83. Member countries were positive about the effectiveness of their outreach activities.

84. The Canadian experience is that information sessions for reporters are successful in helping facilities better understand their reporting requirements, and therefore in improving their ability to submit information of high quality. Efforts to work collaboratively with individual industry sectors to develop reporting protocols and improve guidance for their sector have also been quite successful at improving data quality and consistency.

85. When the case officers at the Norwegian authorities are checking the reports, they often contact the facilities by phone or by e-mail. These actions will improve the quality of the data in a lot of cases and it will also clear up some misunderstandings.

86. In Japan, the identification of the total handling process for chemical substances makes businesses aim for a better accuracy of the calculation of releases, and a decrease of releases is the result. It is not from a direct visit to facilities, but from the result of a questionnaire to businesses that a reduction in releases has been identified. In a recent survey (June 2004), 15% of the answers (out of 1 018) attributed the reduction of releases to “the improvement of the accuracy of the method of calculation of releases”. The reasons for businesses adopting a reduction plan were:

- Voluntary action (68%);
- The request of customers (6%);
- The guidance of industry associations (4%);
- The guidance of regional governments (2%); and

- Other reasons (20%).

87. Examples of the programmes for the reduction of releases of PRTR chemicals by the Ministry of the Environment are available on the Japanese PRTR website in Japanese only.

88. The States and Territories in Australia have reported improvements to data quality as a result of training and support activities. In particular, it has been noted that:

- Phone-based support is considered very effective and all jurisdictions provide this mechanism. This is partly a result of the large distances in Australia and the remoteness of some reporters (such as miners in the State of Western Australia) for whom it is logistically difficult and costly to provide other means of support. Moreover, as illustrated by the State of South Australia, each facility is different and so personalised phone-based contact is often the most effective device in facilitating data quality;
- Email-based contact is also considered very effective. Data can be exported into an email message from the database that the jurisdiction is using. The technical contact at the facility can then quickly ascertain the issues and act to improve data quality. A return email to the jurisdiction can contain the new data or confirmed data and an explanation substantiating the data from the facility. This method of support and data enhancement is used extensively in the State of Queensland;
- The State of Western Australia and the State of South Australia provide (or have provided at various times as required), phone and email support to reporters from suitably qualified staff. These include chemical engineers, metallurgists, and environmental scientists;
- The State of South Australia, Western Australia, and the State of Queensland have surveyed reporters to determine what support reporters actually require. This information is used to develop a more effective support framework which in turn is intended to improve the quality of data;
- The State of South Australia and the State of Queensland have developed industry-specific tools (such as a wine calculation tool for the wine industry) with an aim to making reporting easier and thus reducing errors;
- The State of Queensland has developed simplified reporting forms for some industries, such as intensive livestock, that double as a calculation tool and a reporting form;
- All jurisdictions maintain email lists for rapid dissemination of important information. However, all noted that continual turnover of reporting contacts within facilities makes the maintenance of such lists difficult;
- The State of Tasmania indicated that data quality has improved over time as reporters become more familiar with the reporting process.
- The State of Victoria has noted that reporters commonly change their complete reporting staff within four years. This means training and support must be dynamic and responsive to accommodate a constant flow of new users. Moreover, staff turnover presents a considerable administrative overhead to jurisdictions in keeping contact lists current; and

- All jurisdictions indicated that the reporting community was receptive to the provision of training and support, particularly phone and email support. The State of Western Australia noted that seminars and workshops were very effective. The State of Queensland indicated that basic training and support is important due to the high turnover of the technical people carrying out the reporting at facilities. This response is representative of the diverse range of industry in Australia (the prevalence of manufacturing in the State of New South Wales compared to mining in the State of Western Australia) and to the turnover in the reporting staff at facilities.

CHAPTER 6: EFFECTS OF DATA COLLECTION ON DATA QUALITY

6.1 Mechanisms for Data Collection

89. The mechanisms for data collection can be an important vehicle for data quality (*e.g.*, there would be different data quality checks built into a paper reporting form compared to electronic delivery of data to an authority).

90. In Belgium, E-PRTR reporting is possible for each region in two ways: in electronic format with an Internet-based reporting tool or otherwise on paper. In this on-line reporting tool, several mechanisms to improve data quality are built in. First, the data already known to the authorities is already available in the reporting tool (*e.g.* activity codes, emission points, installations, etc.). In this way more consistent time series of data are obtained. Next, impossible or incoherent data are refused by the reporting tool (*e.g.* $0 < \text{pH} < 14$). Last, facility totals are calculated by the reporting tool, avoiding calculation and data transcribing errors by the reporters.

91. In the next step, the emissions and offsite transfers of waste are compared to both (if available) the data of the previous reporting year and other sources of information (*e.g.* monitoring results for water emissions). If large differences are found (*e.g.*, more than 100% difference), the data are checked again. If no explanation can be found, these data are cross-checked with the reporters. In a final stage, the data are submitted to the reporters for final check before being published or reported to the European Commission.

92. In Spain, the whole system is designed to deliver information electronically, but Competent Authorities also activate other means to deliver such information (nevertheless, electronic format stands for more than 80% of the data gathered). Data are collected at facility level and public data are available both at facility level and at an aggregated level. The operators or owners of the facility have to assure the quality of these data, and the Competent Authorities revise and, when appropriate, validate them. Afterwards, the Spanish Environmental Ministry receives all data and, prior to its publication, makes a final revision in order to identify possible mistakes. If anything anomalous is noted, the Spanish Environmental Ministry contacts the Competent Authority and they begin the validation process again.

93. Recent experience in the Netherlands points to the use of electronic reporting to improve data quality by providing default emission factors for companies and sectors for which no measurements are available.

94. Facilities in Australia may currently report via three methods:

i) The National Pollutant Inventory Paper Reporting Form:

This method is used by approximately one third of all reporters. The facility may complete the form themselves or, in many cases, employ an environmental or chemical consultant to do so. Data transcribing errors are potentially possible when inputting these data into an electronic form.

ii) National Pollutant Inventory Online Reporting System:

The NPI online reporting system enables reporters to view, edit and submit their NPI report via the internet. The system pre-populates data based on the previous year report, and contains a suite of calculation tools that the reporter can download to estimate emissions from their facility. Standardised, nationally consistent validation will alerts the reporter to any potential problems in their report. The system can be used by facility personnel, or their authorized representatives, in any state or territory.

To obtain access to the NPI online reporting system reporters must complete and submit an application for registration.

There are two levels of access available to users of the system:

- Reporters - can enter the basic elements of an NPI report, however they cannot submit (certify) the report. Consultants or contractors are restricted to reporter level access; and
- Coordinators - can enter all elements of an NPI report, and can submit (certify) the report. Facility or company personnel can be coordinators.

The NPI online reporting system is the replacement for the National Reporting Tool (NRT) which was developed by the State of Victoria as an electronic data collection mechanism with built-in validation. This was been adopted by all jurisdictions except for the State of New South Wales.

iii) The National Reporting Tool (NRT):

The NRT was developed by the State of Victoria as an electronic data collection mechanism with built-in validation. This has been adopted by all jurisdictions except for the State of New South Wales. The NRT is complex to use and has a number of features which make it difficult to use for data validation.

iv) Other Methods:

In some jurisdictions reporters may use alternative electronic tools to submit data. For example, in the State of South Australia a spreadsheet to calculate emissions has been created for the wine industry. In the State of Queensland customised forms are used extensively to streamline recording of emissions data for specific industries, particularly for smaller businesses. The alternative tools are simplified versions of the Emissions Estimated Techniques and may assist in improved data quality.

95. Development of the Australian Online Reporting System:

- i) Following a review of the NPI in 2005, Australian, State and Territory Environment Ministers agreed to prepare a variation to the NPI NEPM to include such parameters as transfers as well as improving operational issues such as the introduction of a streamlined online reporting tool;
- ii) Over a 12 month period, requirements were gathered and collated from the NPI's diverse user group, leading to the formation of a comprehensive specification. The design of the system allowed for the greatest flexibility, within the parameters of the available technologies of the department.
- iii) Key features of the system include:

- Multi level access, to allow for flexibility in reporting by users;
 - Integration with GIS systems;
 - Standardised calculation tools based on recently updated Australian industry based emission factors;
 - Use of web services to interface with government and industry systems; and
 - Consolidation of 9 databases into 1 centralised database.
- iv) From August 2007, a beta release of the online reporting system was used by industry, and full release occurred in January 2008;
- v) The online reporting system is currently being enhanced to accommodate changes to the NPI NEPM, including Transfers of NPI substances to Waste;
- vi) Phase 2 of the project involves improvements to update the NPI web site; and
- vii) Overall, the project seeks to improve data quality through standardising data collection and achieving national consistency. Through these changes the NPI seeks to enhance its credibility as a national database.

96. The European E-PRTR's requirement of obliging reporters to use, in the case of measurements (M) and calculations (C), internationally approved methodologies (*e.g.*, CEN or ISO standards), where available, will support the quality of data especially regarding its comparability between different Member States.

97. Environment Canada has a national on-line reporting mechanism which collects environmental data from industry for the Canadian NPRI, as well as for other federal programs, provincial and municipal governments, and the private sector. To date, seven partners are using the "One Window National Environmental Reporting System" (OWNERS). The OWNERS electronic reporting forms guide the users through the completion of the forms and incorporate data checking procedures that highlight potential errors (for example, incorrect units) to the user as they enter the data. The system also requires reporters to enter a reason and comment when the data changes from previous years by a significant amount, which facilitates subsequent data quality checking. During the first year of implementation, over 99% of facilities reported on-line.

98. Some key benefits of such integrated reporting are that facilities spend less time reporting to different jurisdictions, and therefore, have more time to focus on improving data quality. In general, the quality of the reported data was found to be much higher when using these systems rather than paper forms. Governments also spend less time collecting data – the savings can then be allocated to other priorities including efforts to improve data quality. In addition, this provides for more consistent data sets across jurisdictions, and a more efficient and timely release and publication of reported information.

99. Facilities in the United States can submit data over the Internet, via diskette, or with a paper form. Facilities that submit their data over the Internet receive an email receipt once EPA captures their submission. Approximately 97% of all data submitted to EPA's TRI Programme are submitted in electronic format; 74% of all data were submitted via the Internet.

100. There are three reporting methods in Japan: by paper, floppy disk and electronic reporting. In FY2006, the ratio of reporting methods was 57% (paper), 3% (floppy disk) and 40% (electronic reporting). The number/ratio of electronic reporting has increased by about 39% over the last six years due to promotion by brochures and direct mail to the reporters. In cases of using floppy disks or electronic reporting, a data checking programme is incorporated, so the reporting form is checked. By this checking system the reporters can reaffirm the data.

6.2 Use of Reporting Software

101. Over the past three to four years, several member countries have developed reporting software and systems to streamline reporting for facilities. This is one of the current and emerging factors that are directly leading to improvements in data quality. Some examples from member countries are given in this section.

102. Reporting software is employed in the US Toxics Release Inventory programme. The Toxics Release Inventory – Made Easy (*TRI-ME*) software is an interactive, intelligent, user-friendly software tool that guides facilities through the TRI reporting requirements. In addition, the software incorporates many data quality checks to prevent incorrect data entry, blank entries, as well as many other possible errors in reporting.

103. The use of the software has improved the quality of the data submitted to EPA, allowed the EPA to focus on other data quality matters, and made it easier for facilities to submit their data to EPA correctly. In reporting year 2006, 97% of facilities used the software to file their reports. EPA is in the process of migrating from the current desktop-based version of the software to a web application. The web application will feature enhanced data quality and error validation, automatic pre-population of current year forms based on prior year submissions, quicklists, trend analysis reports, form-based data entry, “Real Time” Facility Data Profiles and previous year revision capability

104. Information required by the UK’s Pollution Inventory (PI) can be provided by a number of means:

- Completion of an electronic form on-line. This form is available via the PI homepage on the Environment Agency’s website – www.environment-agency.gov.uk/pi. Follow the links to Pollution Inventory Electronic Data Capture [PIEDC] system;
- Submission of an electronic file in XML format; or
- Completion of paper form(s).

105. The PIEDC is a secure system and requires operators to log-in using a unique password. The on-line system was first used in 2003 for reporting 2002 data. Currently, approximately 50% of returns are made via this system.

106. A guidance document to support the operator in the use of PIEDC “Guidance on using the Pollution Inventory electronic data capture (PIEDC) application for Integrated Pollution Control, Pollution Prevention and Control and Waste Management License operations” has been prepared and is available from the above website. This takes the operator through accessing the system, logging in, system overview and a step-by-step guide to data entry using the web form. The national UK Pollution Inventory team also provides telephone support for use of PIEDC.

107. In addition other general and sector-specific guidance documents and tools are available to help operators make their Pollution Inventory return – available from the above website.

108. The web-based reporting form incorporates a number of data checking procedures and raises Check Flags to the operators at the time of completion. The Check Flags are triggered if:

- ‘BRT’ [Below Reporting Threshold] is entered compared to an emission from the previous year;
- Release is high compared with the previous year [$>50\%$ of the value];
- Release is low compared with the previous year [$<50\%$ of the value];
- Release is high compared with threshold [factor of 5 times or more]; or
- Release is below the reporting threshold.

109. If these Check Flags occur, the operator has to provide explanatory comments before the form can be submitted.

110. Lessons learned:

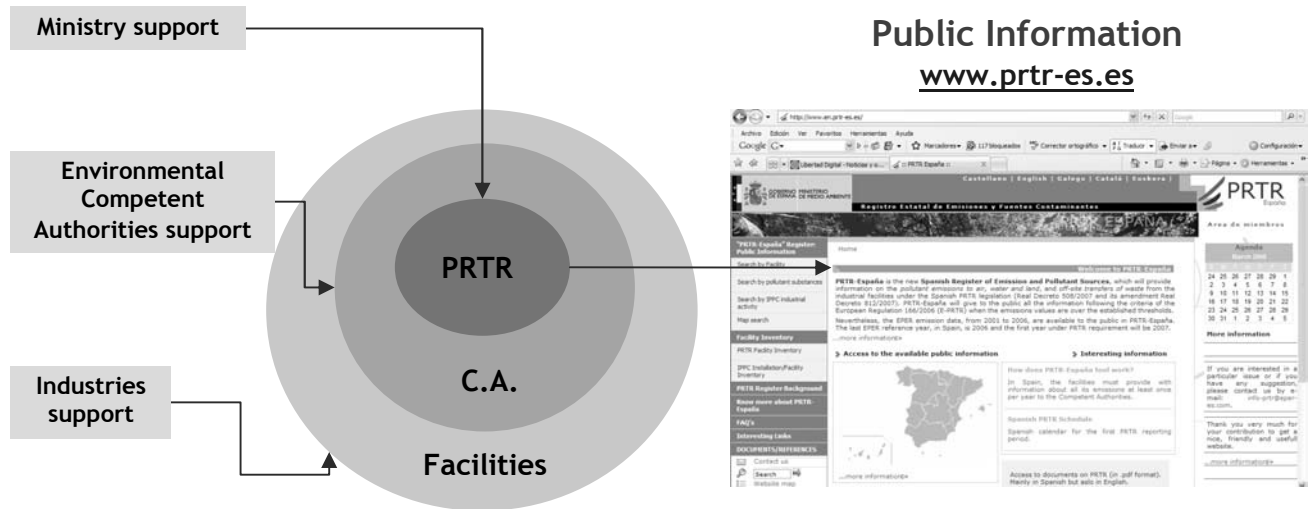
- The use of the web-based system can identify common errors at the time of data entry, for example, entry of data in the wrong units;
- Some issues have been encountered with PIEDC, including incompatible computer operating systems or browsers used by operators;
- Using a web-based system can be slow for the operator; particularly close to the submission deadline; and
- Operators forget how to use the system as they only use it once a year.

111. The use of electronic reporting in the Netherlands has been quite a success. As at 2006, about 90% of the companies use the electronic reporting tool.

112. Up to now, facilities in Norway have been reporting on a paper format. The year, 2007, is the first year of electronically reporting. By using electronic reporting formats it is possible to have some automatic checks on the quality of the data. The results from the automatic quality check are visible for the officers who do the quality control in a computer tool designed for the quality check. Data for emissions to air and water and energy use are controlled automatically by a factor 10 compared to data reported for the previous year. If the reported value exceeds the factor 10 the reporting line is marked by a sign to make sure that the reported item is checked thoroughly. Reported data on amounts of waste are controlled in the same way, but by a factor of 2 compared to data from the previous year. There is also an automatic check on unit of measurement.

113. The electronic tool developed by the Spanish Environmental Ministry is designed to be a dynamic and integrated tool for gathering, management and dissemination of data, located on internet (www.prtr-es.es). The whole process (reporting, validation and publication of data) can be carried out by facilities and Competent Authorities using the same tool.

114. So the Spanish electronic tool allows both to receive the information directly from the industrial facility (provided it is not placed in an Autonomous Community that has its own collection system) and it also allows those Competent Authorities (CA) that have their own reporting system (Aragón, Cataluña, Andalucía, Castilla-La Mancha, Comunidad Valenciana, País Vasco and Galicia) to upload all information.



115. Reporters are encouraged to use reporting software in Japan. In cases of using electronic reporting or floppy disks, a data checking program is incorporated which assists the reporters to reaffirm the data.

CHAPTER 7: ENSURING THE QUALITY OF DATA

7.1 Data Validation, Data Quality Checks and Data Verification

116. European PRTR data are firstly reported by operator of each facility subject to E-PRTR reporting requirements which shall assure the quality of the information delivered. In particular the operator shall collect with appropriate frequency the information needed to assess the emission levels against the reporting thresholds and he is obliged to use the best information available to report to the E-PRTR authorities.

117. Secondly, the PRTR competent authorities shall evaluate the data provided by operators in particular as to their completeness, consistency and credibility. In doing so authorities benchmark data reported against information that is already available, for example:

- Information collected during licensing procedures or compliance checking of permits;
- Self-monitoring reports of the facilities delivered to the authorities; and
- Information related to the participation in the Community Eco-management and Audit Scheme (EMAS).

118. It is the responsibility of the Member States and other contributing countries to check in particular the completeness, consistency and credibility of their data before submitting them to the European PRTR. The quality of the European PRTR data is checked at the local, regional, and national level before the data are included in the European PRTR. A validation tool is used for data delivery from the Member States to the European Commission. It incorporates a number of data and completeness checking operations. This can be considered as the last data quality check before the review report. The report analysis the data submitted by the Member States also in comparison with past deliveries. A detailed explanation of the quality control and assurance processes in the EU Member States is available in the European PRTR guidance document (<http://www.eper.ec.europa.eu/eper/Gaps.asp?i=>).

119. The European Commission is obliged to co-ordinate the work on quality assurance and assessment in consultation with a Committee established by article 19 of the Regulation.

120. In Spain, data are collected at facility level. The facility operators or owners must provide their data once a year to the Competent Authority. According to the Spanish PRTR legal act (Real Decreto 508/2007), per each reference year, the deadline to receive all the information at the Ministry is the June 30th following the reference year. So the schedule planned by the Spanish Environmental Ministry for the collection of data through PRTR criteria involves that data should be gathered during the first three months of each year following the reference year. Then, Competent Authorities review and validate the reported data. Although Competent Authorities are mainly the regional governments (Autonomous Communities), data from direct discharges to surface water are validated by the corresponding River Basis Authorities at national level. Afterwards, when all information is already available for the Ministry, a second revision process takes place before data publication on the web page. More information about this process can be found in the PRTR-España web site: www.prtr-es.es.

121. The Canadian government agency, Environment Canada, performs data quality checks and data validation for the NPRI to identify potential problems with the data. Although Canadian law does not require that quality assurance is performed, it is part of the data management process carried out by the federal government after receipt of data from facilities. All of the data quality checks and data validation are carried out by the government agency responsible for the PRTR. These data quality checks focus on the amounts reported for releases and transfers. However, it is also important to perform checks on the supporting information such as facility locations and business numbers, to ensure that the data can support mapping applications and be compared with other related data sets.

122. The United Kingdom's Environment Agency performs data quality checks on the Pollution Inventory returns at three levels:

i) Data is first verified for accuracy by local regulatory site officers/teams with local knowledge of the site. As part of this exercise the verifier should:

- Clear any outstanding Check Flags raised by the Pollution Inventory Electronic Data Capture System PIEDC [see above];
- Check that all expected substances have been reported;
- Confirm any explanatory comments made by the operator are justified;
- Use local site knowledge to determine whether changes in releases are valid; and
- Provide commentary on significant changes or other changes within PIEDC.

ii) An overview audit of the Pollution Inventory annual dataset is carried out at a regional level by data, information and assessment teams not involved in the site regulation. As part of this audit the following should occur:

- Identification of outliers in individual PI returns;
- Assessment of trends in releases of selected key substances for the region; and
- Identification of changes in top releasers for selected key substances.

iii) A national data audit is conducted by the national Pollution Inventory team. This performs similar tasks to that of the regional audits but at a national level and helps to confirm data accuracy before the data is supplied for use internally and published externally.

123. In respect to the identification of outliers, the dataset is currently downloaded from the web-based system into an Access database for review and analysis. It is hoped in the future that the web-based system will have greater functionality to be able to review and analyse the dataset directly.

124. The database contains a number of quality assurance tools that identify the outliers and possible anomalous data in the most recent year of data. The tests can be performed on the full Pollution Inventory dataset or the data for just one Environment Agency area, region or Government Office Region. In addition, the industry sector and release or transfer route of interest can be specified.

125. A statistical study of the Pollution Inventory data was carried out and the following approach for identification of outliers was developed. Following initial modification, this approach now only identifies outliers in the most recent year of data:

Maximum release of a substance (or waste transfer) to a route by one authorisation / Average of releases of that substance (or waste transfer) to the chosen route by the same authorisation for all other years = Database field 'Max/AvRest'

Outlier identified where the 'Max/AvRest' value is greater than a preset trigger value, and the outlier occurs in the most recent year of data (see below for explanation of trigger values)

Minimum release of a substance (or waste transfer) to a route by one authorisation / Average of releases of that substance (or waste transfer) to the chosen route by the same authorisation for all other years/(Average for all other years) = Database field 'Min/AvRest'

Outlier identified where this value is less than a preset trigger value, and outlier occurs in the most recent year of data.

126. Pollution Inventory returns should only be assessed where they have reported two or more years of data for a particular substance or waste transfer to a particular route (air, water, sewer, disposal, recovery, etc.) above the reporting threshold.

127. It is largely a matter of judgement and balance of workload as to where the 'Max/AvRest' or 'Min/AvRest' trigger value should be set for a given number of years and for a given industry sector. Substantial differences in the variability of releases can arise between different industry sectors and different routes, and generally the fewer the number of years of data the greater the expected variability in releases. The trigger values vary between industry sector, the route, and the number of years of data. The trigger values are set each year by the national PI team.

128. Queries raised during the overview audit are passed back to local officers and teams to investigate.

129. All of the above may require further contact with the operator following their submission and staff rely on telephone contact with reporters as a major way of improving data quality.

130. Data quality checks for the Australian NPI are carried out at two levels of government. Reporters are required to submit their emissions data to one of the nine states and territory government agencies and these agencies carry out data verification using their own systems. For example, in the State of Queensland scientifically qualified staff assesses the veracity of the data and the calculation techniques. The data are checked against expected values and outliers are referred back to the reporter. The data are then required to be submitted to the Australian Government agency prior to publication on the NPI website. The Australian Government agency assists the jurisdictions by sending them data validation spreadsheets to use prior to data upload to the Australian Government agency. In addition, the Australian Government agency also runs a series of data validation checks to see if there are any major discrepancies or conflicts in the data.

131. In Japan, as the checking system of the PRTR reports covers data from more than 40 000 facilities, local governments and the national government perform data quality checks. The quality checks cover both the reporting form checks and the accuracy data of releases and transfers checks.

132. With respect to the data validation for Japan, trigger values are set from the view point of the comparison to the previous year's data, the business category, scale of operation, and physical and chemical properties. In addition, technical staff contacts the facilities to confirm the values.

133. In the US TRI Programme, all facilities that submit data to EPA can access a follow-up report called the Electronic Facility Data Profile (eFDP). The eFDP is a report that is posted on a secure website that echoes back the submitted data and presents informational messages about the validity and quality of

the data as submitted by facilities. Facilities sign into the secure website, review their reports and if they feel necessary, submit revisions. Additionally, each year, months before EPA makes available its latest data, the TRI Programme conducts an analysis of the data to screen it for outliers, and reports are generated identifying facilities that have shown substantial changes in the quantities of releases they have reported for TRI chemicals relative what they reported in the previous year. In addition, another report is generated that identifies an extensive list of anomalies in the data. All these reports are reviewed by staff and a list of facilities that have what appear to be probable reporting errors is formulated. Technical staff within the TRI Programme contacts these facilities to discuss their submissions and, where errors are confirmed, have the data revised.

134. The US TRI Programme has also worked to improve the location data (*i.e.*, latitude and longitude) of reporting facilities through the use of EPA's Facility Registry System (FRS). FRS is a centrally managed database that provides Internet access to a single source of comprehensive information on facilities subject to environmental regulations and/or of particular environmental interest to EPA. The FRS database currently contains over 1.9 million unique facility records, and new facilities are continuously being added to the system, either through information supplied by EPA programmes or through State partners. The FRS database contains accurate and authoritative facility identification records which are subjected to rigorous verification and data management quality assurance procedures. Additionally, FRS receives correction and verification information from the reporting community through web-based access and through EPA database systems maintained by over a dozen EPA media programmes.

7.2 Error Correction Procedures

135. If a competent authority has ascertained that there are errors in data submitted to them, then there have procedures in place to identify and to correct the data. Some examples from member countries are given in this section.

136. The state and territory environment protection agencies in Australia are responsible for any corrections of errors. Where data errors are identified, or the data are deemed questionable, these agencies generally contact the reporter and any necessary correctional action is taken. If data errors are identified at the Australian Government level, the requirement of the PRTR is that the state or territory agency is contacted and asked to investigate the alleged discrepancy. In the case of an error being identified by the facility, the state or territory agency must instruct the Australian Government to change the data.

137. Auditing of reports also occurs in Australia, for example:

- The State of Western Australia conducts desk audits and some on-site visits to reporting facilities to check on their compliance with the NPI reporting requirements. Other states and territories also undertake some site or desk audits each year; and
- In the State of Queensland, facilities are identified for audit based on any discrepancies in their reports. Approximately 5% of reports (~50 reports) are selected for audit and for 1% (~10 facilities) this involves an on-site site audit which uses a specialised audit protocol.

138. In Japan's PRTR system, local governments and the national government investigate questionable data, and if necessary, the data are revised. In addition, businesses are able to submit notifications for revision to correct published data if the reporters recognize errors.

139. After the annual publication, revision of the data is available and it is possible to submit the notification for revision during April to June of the following fiscal year, and the data will be renewed at the same time as the next round of new PRTR data are published.

140. In Canada, if questionable data are identified for a reporting facility, a series of escalating actions are taken, from an initial email asking for confirmation or change of the data, to a formal letter, to telephone follow-up with the technical contacts and then the certifying officer (usually the president or CEO), to possible enforcement action. Changes to reported data are made by the facility through the online reporting system.

141. The US TRI programme has a withdrawal process in place. Facilities that filed a TRI report may submit a request to revise their submission(s) in EPA's databases. Facilities may request a revision for one of several reasons, such as:

- Revise facility identification information;
- Revise chemical identification information;
- Revise release and other waste management activities information;
- Revise as a result of an EPA/State inspection;
- Revise as a result of a Notice of Technical Error (NOTE), Notice of Significant Error (NOSE), or a Notice of Noncompliance (NON); and
- Revise as a result of a voluntary disclosure or audit policy.

142. In Spain, the facility is responsible for the accuracy of the data. However, Competent Authorities must validate the data. During the validation process Competent Authorities can ask for additional information from facility operators or owners, either when errors are identified or data are questionable. Also the Ministry during its final revision process prior to making the data publicly available contacts Autonomous Communities if any data seems doubtful. Only data which have been validated by Competent Authorities are published. Correcting errors in published data on Spanish PRTR website is also possible. In this case, corrections must be notified by Competent Authorities to the Ministry.

7.3 Comparing Calculated Concentrations of Substances with Measured Values

143. In 1985 a substance directed policy was developed in the Netherlands and with emissions from all sources being collected, it became possible to develop a tool in which the primary emissions could be used in pollutant transport models. The calculated concentrations of emitted substances could be compared with the concentrations of substances measured in the environment. This is a most useful tool for controlling the quality of the input data as well as calibrating transport models and choosing the optimal place for measurements of substances in the environment.

144. However, this technique can only be used if the PRTR system contains information of comparable quality about all sources of pollution based on a sufficiently detailed geographical information system. Also, the pollutant transport models have to be developed to a level where consistent information on deposition can be provided. For air transport modelling this is the case nowadays. Water transport modelling in river countries is usable with some estimations being made about secondary emissions from sludge. Soil transport modelling is also in the developing stage and the results are rather uncertain at present.

145. The cost of running a pollutant transport model can vary greatly from simple local models to long range transport calculations. For water transport a simple box model is easy to run but assumptions on secondary emissions or flow variations can complicate matters.

146. This tool is very useful as well for calibrating pollutant transport models as well as checking quality and completeness of the emission data. The CLRTAP has been using the tool for many years, first only for the combustion gases, later also for heavy metals and persistent organic substances. For the combustion gases the fit is acceptable at the moment but for the heavy metals there are still many gaps due

to incomplete reports from the different countries. In the Netherlands, for air pollutants there are national, regional and some local models available. For water, there is a model called Policy assessment of the water management in the Netherlands (PAWN) available, for soil transport there is a rather complicated model called “STONE” developed by the agricultural University in Wageningen. The simple local models are sometimes used for short distance relationship between effect of pollution and possible industrial sources.

147. Examples of the use of this technique from the Netherlands are:

- The instrument is very useful for the preparation of so-called criteria documents for individual substances where starting with emissions effects on vegetation and health were evaluated. A very interesting example was the benzene document where a big gap was found between calculated concentrations and the measurements. The gap was very big in one of our southern provinces. It appeared that a big benzene plant in a facility which was down at the reporting time was operational again when the measurements were made. However, there remained a gap the size of which was more or less proportional to the population density. Looking at the basic data again, benzene from traffic was only calculated from the amount of unburned fuel. From a literature survey it could be concluded that benzene was also generated in the engine. Correction of the emission factors enabled us to close the gap within acceptable limitations
- For ammonia there was also a big gap. As the main source in The Netherlands is mainly the manure from cows, pigs and chickens, it looked like some of the reasons might be an optimistic estimation of the effect of the applied abatement measures. At the moment the reasons for the gap are reviewed again. But from a scientific point of view the estimation of the emissions as well as the measurements have their limitations.
- When detailed measurements of heavy metals in the influent of wastewater treatment plants became available it was possible to compare the indirect emissions to sewer systems with the measurements at the wastewater plants. There were also a lot of gaps. It looked like the differences were the biggest in areas where many small non-reporting metal products industries were connected. As the emissions from this sector are mainly extrapolated from the big reporting companies this might suggest an underestimation of their emissions. There was even a case where the copper concentrations at the plant were lower than expected. A suggested explanation was that we overestimated the corrosion of copper drinking water lines.
- Several years ago an NGO (Reinwater) applied the so called “RUNNING WATER” model to one of our big rivers. A vessel equipped with measuring instruments made continuous measurements while drifting with the streaming water. If sudden peaks were detected downstream of an emission point of a facility it could be checked if the substances measured were in the report. But this is not a standard procedure anymore.
- A more recent example was an effort for the greenhouse gases to correlate emissions with concentrations. This was rather successful for methane but for the other greenhouse gases there were still some gaps that could be related to uncertainties in the emission estimations. The work is being continued for instance by the Joint Research Centre of the European Union.

148. A lesson learned is that estimations of emissions from non-industrial or non-reporting industrial sources in combination with a geographical database open opportunities for quality improvement.

7.4 Validation Software

149. Validation software is that software used after the reporters have submitted their data to the competent authority. Some countries use reporting software that includes data validation while other countries have developed stand alone software.

150. The member states of the European Union are supported by the European Commission, which provided an electronic validation tool for use by the member states. The validation tool is downloadable from the website and comprises several electronic checks of the PRTR-related data in order to ensure specific quality requirements. The validation tool is a software application which has easily detected erroneous data in former reporting cycles such as incorrect co-ordinates, wholly incorrect figures, pollutants reported twice and facilities with no reported releases, etc. The use of the validation tool will support the quality of delivered data and the compliance with the data format set in Annex III of the Regulation.

151. Validation software for those Competent Authorities that have their own collection system has been developed in Spain. This software is integrated into the Spanish PRTR e-tool. It means that validation procedure of uploaded data by Competent Authorities is an “on line” process and it is carried out in restricted area of PRTR-España website. When the uploaded information lacks of any of the essential parameters (many significant figures, method for obtaining the data, to which media the emission relates to, etc.) a report of errors is generated by the application. Once mistakes are corrected the Competent Authority uploads a new file, which has to be validated again. When no errors are detected, the submitted information is finally incorporated into the PRTR Ministry database.

CHAPTER 8: ACTIONS OF STAKEHOLDERS AND THE PUBLIC CAN IMPROVE DATA QUALITY

8.1 Who are the Stakeholders and the Public?

152. The primary purpose of PRTRs is to make release and transfer information available to the public to use. Key users of PRTR data include international organizations, environmental non-governmental organizations, civil society, academia, aboriginal groups, industry, and government agencies. It is very important to ensure the quality of PRTR data so that users will find it credible and useable. In many instances, users of the data will contact an authority querying the quality of the data.

8.2 How to present the Data to the Public?

153. The UK's Pollution Inventory data is not a static database and there may be continual minor updates throughout the year. Previous discussions have occurred as regards this issue which concluded that as the data are published down to individual site level on the Environment Agency website [<http://maps.environment-agency.gov.uk/wiyby/dataSearchController?topic=pollution&lang=e>] for use by the public and others, it is important to always present the correct data to the best of our knowledge. If an industry operator identifies an error in their data during the year, they would expect this to be corrected so that the public can see the correct data. However, once the various levels of verification have occurred as detailed above, any changes are expected to be minor and not significant as regards total figures or trend information for England and Wales.

154. Statements about data accuracy or limitations on the data are made on PRTR websites. These are important to assist stakeholders to use and interpret the information appropriately. For example, Australia has the following text on the NPI website:

"The NPI comprises estimated emissions. The techniques used to estimate emissions have been variously approved by Australian, state and territory environment agencies but it is important to note that the accuracy of these estimates is likely to vary according to the technique used. For the diffuse (non point source) data in particular, comparative analysis of the data may be misleading, because jurisdictions may have used different approved estimation techniques. Emissions data for facilities are those data provided by the facilities concerned. Diffuse data are the most up to date available. The diffuse data are not necessarily for the particular facility reporting year being examined. For example, diffuse data may be from a study completed in 1998-99 and the facility data from 2001-02."

155. In Australia, public scrutiny has an important role in data quality. Although not required by the PRTR system in Australia, the Australian Government provides one opportunity to reporting facilities for incorrect data to be changed after the annual publication of data on the website. This usually occurs about two months after data are required to be published and its sole purpose is to correct data and improve the integrity of the NPI database.

156. The US TRI programme publishes, along with its Public Data Release (PDR), a number of documents that set the context and limitations for use of the data. Specifically, a brochure providing a quick overview of TRI data, an eReport providing information on trends, a summary of key findings, and State Fact Sheets are all part of EPA's annual public data release. All of the materials provide context and provide tools to data users for reviewing the data. Active stakeholder review of the TRI data encourages facilities to submit data of high quality and can serve as a source for identifying data quality issues. (See <http://www.epa.gov/tri/tridata/tri05/index.htm>).

157. The web page of PRTR-España is available not only in Spanish but also in other Spanish languages, and in English. Besides accessing the public information both at facility and aggregated level, general information about how the system works can be consulted on this page. Also FAQ's, references and documents, links, etc, are available to the public.

158. In PRTR-España the updating of public information is periodical. Emission data can only be corrected or updated by The Spanish Environmental Ministry following the instructions given by the Competent Authorities. When facilities detect any kind of mistakes in their data then they have to request for correction to the corresponding Competent Authority. The data updating, when approved, is automatic in all the linguistic versions.

8.3 Stakeholders and the Public can act to improve Data Quality

159. PRTR Programmes in North America have found that publication of PRTR data by international organisations and NGOs can raise the profile of the data and highlight reporting errors made by reporting facilities. One example is the North American Commission for Environmental Cooperation's (CEC) *Taking Stock* publications. The resulting media and public attention may cause facilities to correct errors in their reported information. In addition, data users of Canadian PRTR data may identify questionable data elements while they undertake analysis, which can then be investigated and corrected if needed. Finally, when international organisations compare data between countries, for example the annual special analyses by the NA-CEC on a specific industry sector or issue, differences in reporting to the countries are identified. When the reasons behind these differences are explored, this can provide useful information to allow efforts to improve data quality within that country such as improvements to guidance.

160. Canada has found that publication of PRTR data by environment NGOs and international organizations can raise the profile of the data and highlight reporting errors made by reporting facilities. One example is the North American Commission on Environmental Cooperation's *Taking Stock* publications. The resulting media and public attention may cause facilities to correct errors in their reported information. In addition, data users of Canadian PRTR data may identify questionable data elements while they undertake analysis, which can then be investigated and corrected if needed. Finally, when international organisations compare data between countries, for example the annual special analyses by the NA-CEC on a specific industry sector or issue, differences in reporting to the countries are identified. When the reasons behind these differences are explored, this can provide useful information to allow efforts to improve data quality within that country such as improvements to guidance.

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162. One of the main aims of the PRTR-España web site is to offer to the public as comprehensive environmental information as possible. It means not only to promote the awareness of the Spanish Register according to legal requirements but also to identify and assess the needs of the public in order to get the best understanding and use of the published information disseminated by the Register. In this sense some additional initiatives are being considered, such as:

- The possibility for the facility operators or owners to upload documents for the public concerning additional environmental performance of the facility;
- The possibility to create new sections where additional information on industrial sectors could be found;
- The possibility to publish specific permit conditions jointly with the emission data at facility level;
- The possibility to allow the users to download public information directly from the web site, etc.

163. The participation of the stakeholders and the public in general in this process is guaranteed, *e.g.* with a possibility to send their needs, suggestions and questions on how to improve the quality of information directly through internet (www.prtr-es.es). This functionality is also available in the English version of the Register.