REVIEW OF THE MODEL DOCUMENTATION SYSTEM

RECOMMENDATIONS FOR THE DEVELOPMENT OF VERSION 2

Report of a workshop held on 25 September 1997, Cambridge, UK

As part of the task "further development of air pollution modelling infrastructure and applications", the European Topic Centre on Air Quality (ETC/AQ) has developed a Model Documentation System (MDS). The system has been made publicly available on World Wide Web since spring 1997.

On 25 September ETC/AQ has organised a workshop with both users of the MDS and with model experts to evaluate the MDS. A list of participants is attached as Annex I. After a introduction by Gordon McInnes on general aspects of the European Environmental Agency and the ETC/AQ, a short introduction on the MDS has been given.

The operational pilot version is available from the WWW; the system now contains information on 29 models. So far the ETC/AQ has been very liberal in the acceptation of models; only one model for which model software did not yet exist (only a conceptual framework was available) was excluded. A search in the system can be made either as structured search using pre-defined key words or as unstructured search using any text string as search parameter. The ETC/AQ is indebted to the model developers who provided their model descriptions and to Helge Olesen who developed the first ideas of a MDS.

The discussions during the workshop were focused on the following points:

- updating the system (changes in concept, changes in or extensions of key words)
- suggestions on ways to ensure the credibility of the MDS (discussion on quality criteria)
- procedures for including new models and updating of existing model information.

The main conclusions will be presented here. The discussions resulted in a workplan for the development of version 2 of the MDS which is attached as Annex II.

The concept of the MDS was unanimously considered adequate. Most of the participants wished, however, that the quality assurance aspect be stronger taken into account in the future development of the MDS. Moreover, links to the own WWW pages of the modellers should be introduced in spite of the risk that the MDS user could thus be led to information of questionable validity. This fact should be stressed by means of a disclaimer.

There was agreement among the workshop participants that both search facilities implemented in the MDS are adequate. As a minor comment it was suggested that the search criteria should be repeated when presenting the results of a structured search.

It should by all means be ensured that the system operates on a server with a sufficiently quick access. The on-line demonstration during the workshop convinced the participants on the satisfactory operation of the MDS residing on its present server.

All key words included in the MDS were found to be relevant. For the convenience of the system user, an additional page should be foreseen listing all key words. Upon clicking on each of the latter, brief explanations should be provided to clarify both the definition and the importance of the respective key word. Most probably, this will also facilitate understanding the meaning of the various pre-defined terms.

Although the above explanations should minimise the mistakes in future model submissions (or updates), a consistency check by the ETC/AQ task team dealing with the MDS will remain indispensable. In the workshop it was recognised that, in principle, it could be possible

to specify the forbidden combinations of pre-defined terms in model submissions (i.e., selections in specific key words which exclude individual selections in other key words, example: “Gaussian model” not compatible with complex terrain). Provided that the necessary resources will be available, this could lead to a pre-processor to the MDS which could perform an automatic plausibility check. Such a tool - even in its preliminary version - could allow determining whether or not a model fits into a category for which co-ordinated validation activities are ongoing or planned (see below).

In the above context, it is crucial that modellers claiming that their entry to the MDS may be used for regulatory purposes provide sufficient clarifying information (for instance in the long description). Examples could be the potential use to address issues introduced by the Framework Directive, or the applicability to questions raised by national legislation. For the less experienced system user it will be crucial to know whether or not the model results themselves correspond to the desired answers. In the latter case, the post-processing needed should be specified in the entry.

The discussion during the workshop showed that only few amendments are necessary in the case of the pre-defined terms. So, “dose” and “concentration fluctuations” should be added to key word “model output”, whereas “scavenging” should be a possible term in responsible to “processes considered”.

Coming now to the long description, it was noted that the option for links to the modellers’ own pages limits the needs for drastic changes. Once again, explanations on the meaning of each section could prove helpful to both the modeller (for preparing his submission) and the MDS user (to be able to work more efficiently with the system).

For reasons of clarity, it was suggested that the heading “detailed entry” be replaced by “basic information”, while the sections “current version” and “last update” should be merged to one with the heading “model versions and status”. Moreover, details on the portability of the models could be of substantial help to the MDS user. Although also useful, explicit information on the user profile (i.e., requirements to the user of a specific model) should not be included, as it may rather easily be inferred from other parts of the long description, above all the structure of the user community and the character of previous applications.

A longer discussion took place on the question whether or not to add to the long description a section on “model limitations”. There was agreement that, in principle, the limitations are closely related to the validation issue, so that a modeller who has not been sufficiently concerned with the question of how (or, at least, to what extent) to validate his model may not be in a position to provide accurate information on the model limitations. Moreover, limitations may follow not only from the basic definition of the problem to be addressed by the model (e.g., plume dispersion, urban air quality etc.), but also from parameters which, at the first glance, appear to be secondary, as for instance terrain steepness or the vicinity of other buildings to a stack.

In the light of the above it was suggested that a section on “model limitations” be included in the long description, while at the same time a disclaimer should make clear to the MDS user the inevitable loss in comparability between individual models because of the expected inhomogenity in the information provided by different modellers on the limitations of their models. For reducing as much as possible these inhomogenities, it was suggested to recommend to the modellers that, prior to their formulating the section on the limitations of their model, they should summarise their responses to questions frequently posed to them on the range of applicability of their model.

As another remark on the long description, the importance of providing information on technical support was stressed. Ideally a link should be foreseen for given the user the chance to directly pose questions related to the model. Such a link would make clear to a potential user that, if needed, qualified support would be provided by the modeller himself or other authorised experts. Moreover, such a link would allow identifying situations of unauthorised model submissions. Finally, the body providing technical support would constitute also an appropriate contact for questions related to model updates (see below).

As a further change to the long description, it was suggested to include the opinion of the modellers themselves on the level of documentation and evaluation of their own model. As a first approach it was proposed to adopt a scheme of quantification similar to that in the report "Ambient Air Quality, Pollutant Dispersion and Transport Models" (EEA Topic Report 19, 1996):

Documentation

1 *Complete documentations available, ranging from the scientific description down to users manuals with details on the machine code.*
2 *Rather good scientific documentation and less complete users manuals.*
3 *Worse scientific documentation as compared to "2".*
4 *Generally, incomplete or messy documentation.*
5 *No documentation at all.*

Evaluation

1 *Hard to achieve because of either still pending work on evaluation, or minor limitations in the measurements available (quality, representativeness, coverage etc.), or both.*
2 *Extensive and good model evaluation has been performed, but still uncertainties because of major limitations in the measured data.*
3 *Considerable uncertainties because of both lack of measurements and an inadequate evaluation procedure.*
4 *Only first attempts towards evaluation.*
5 *No evaluation at all.*

The modeller will be asked to rank the status of documentation and evaluation of his model according to the above mentioned scheme. In the section on documentation relevant references (preferably to open literature) should be given. In a short descriptive section on model evaluation the modeller should indicate (if relevant) whether or not his model has been participating in model evaluation activities (e.g. of the ad-hoc initiative). Hyperlinks to these activities and/or literature references should be provided. The explicit request for information on model evaluation will promote and stimulate the participation of modellers in relevant activities.

Procedures to update the system were discussed. As links to the modeller's own home pages are provided a frequent update of MDS will not be necessary. A yearly update on the scientific information is foreseen. Technical updates (e.g. changes in web address) will take place on a regular base.

Annex I

WORKSHOP ON THE MODEL DOCUMENTATION SYSTEM OF EEA, CAMBRIDGE, 25 SEPTEMBER 1997

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Annex II
Summary of proposed modification in MDS

General aspects
1. adding of 'help' pages:
list of pre-defined key words with a short description of each of them
2. adding a pages with text and hyperlinks to related topics: ad-hoc initiative on harmonisation; dense gas discussion group; COST615 and relevant EEA-pages (e.g. the multi-lingual thesaurus of ETC-CDS)
3. adding a section "what's new" *depending on the funding situation*
4. adding an opportunity for the user to ask general questions on MDS (and/or models in it)

Search:
- recapitulate search criteria when presenting the results of a search

Model description
- allow modeller to specify a link to his own WWW pages
- adding a section "Model limitations"
- adding a section FAQ (frequently asked questions) *depending on the funding situation*
- adding of new key words:
- add address for technical support
- extension of section on model validation (see text)
- (editorial) changes in (sub)headings (see text)

Procedures for updating existing and adding new information

new information
step 1.
Model developer submits information on his model in standard format (see questionnaire)

step 2
ETC/AQ screens received information on completeness and consistency; in case of ambiguity ETC/AQ will contact the modeller. When necessary, ETC/AQ will edit the information to bring it into MDS; final draft text is send to model developer for approval.

step 3
Final text will be included in MDS

updating of information:
1. once a year the ETC/AQ requests modellers to update their information.
2. received information is handled following step 1 to 3 above
3. when during a period of three year a modeller has not reacted on the yearly request for update the model will be removed from the MDS