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A survey to assess the industrial requirement for a code of practice for humidity measurement

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ABSTRACT

A survey has been conducted among industrial users of humidity measurements, as part of a project to create a code of practice for humidity measurement. The survey was intended to stimulate awareness of the proposed Code of Practice, and to encourage the fullest possible involvement of hygrometer users in the formation of the guidelines. The responses to the questionnaire revealed a high level of interest in the prospect of such a guidance document. Detailed comments were returned with some of the questionnaires, and these can be addressed within the Code of Practice document. A substantial proportion of respondents offered to contribute further to the exercise.

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Approved on behalf of Chief Executive, NPL,
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1 INTRODUCTION

The following is a report of a survey carried out among humidity-measuring industries in November 1995. This consultation process was part of Project MPU 8/30.2 (CoP), A Code of Practice for Humidity Measurement, funded by the National Measurement System Policy Unit of the Department of Trade and Industry.

The overall aim of the project is to generate and disseminate a Code of Practice document which will address all aspects of humidity measurement. The Code is intended to provide accessible and authoritative guidance for anyone wishing to make reliable humidity measurements. Topics to be covered include: terms and definitions; selection and use of an instrument for a particular application; calibration; interpretation of results; and other practical advice.

The Code of Practice will be prepared by the National Physical Laboratory (NPL) guided by a management board of the Institute of Measurement and Control (InstMC), with technical input from an independent panel of experts in humidity measurement. Endorsement and publicity by the InstMC will ensure widespread acceptance and adoption, both in the UK and in the international community.

A high degree of consultation has been built into the plan for creation of the Code. Collaboration with the full UK industrial humidity measuring community is being sought via the Technical Panel and by means of open meetings. In order to directly assess the needs of a wide cross section of UK industry, a questionnaire was distributed to organisations with interests in humidity measurement.

The aims of the questionnaire were to:

generate awareness of the project to create a Code of Practice for humidity measurement;

- assess the need for such a document;

gauge the existing awareness of issues in humidity measurement;

- seek opinions as to the importance of the proposed topics, and suggestions as to other topics; and

- invite offers to contribute to the creation of the Code of Practice.

2 METHOD OF SURVEY

The questionnaire was written by the Technical Panel of experts in humidity measurement which was established to draft and advise upon the Code. It was decided to make the questionnaire as concise as possible, in the hope of achieving a high response rate. A more detailed survey could then be sent to interested parties if necessary.

The questionnaire was distributed with a covering letter explaining the project. Also accompanying these was a notice and registration form for an open meeting to discuss the proposed details of the Code. Copies of the questionnaire and covering letter are given in Appendix 1.

Copies of the questionnaire were distributed by members of the Panel (representing about 10 organisations), by the InstMC and by NPL. Each sender selected recipients from their

mailing lists, predominantly aiming at industrial users of hygrometers rather than specialists in the subject. Because of the method of distribution, exact numbers are not known, but it is estimated that close to 3000 questionnaires were sent out. Some respondents would have received copies from more than one source. (A show of hands during the course of the open meeting suggested that this happened in only a minority of cases.) The number of recipients is therefore estimated at between 2000 and 3000.

3 RESPONSES TO THE QUESTIONNAIRE

The number of questionnaires returned was 190, representing a response rate of up to about 10%. A wide variety of industries were represented including (in no particular order):

Hygrometer manufacture and supply
Calibration and testing
Chemical
Pharmaceutical
Biochemical
Aerospace
Defence
Electronics
Water supply
Fuel gas
Electrical power
Process gases
Abrasives
Meteorology
Horticulture
Food
Textiles
Plastics
Paper
Museums and conservation
Photographic
Forensic science
University research
Government departments
Marketing

and many more.

The replies to the questionnaire are summarised below. Where the number of replies to a particular question does not total 190 this is because respondents left some questions blank.

			Priority		
1	What are the important issues in selecting and using humidity measurement?		**High**	**Medium**	**Low**
	1.1	Selection of a type of measurement	101	74	10
	1.2	Selection of a supplier	41	92	54
	1.3	Measurement performance	175	13	0
	1.4	Calibration certificate	113	63	13
	1.5	Cost	56	12	11
	1.6	Life time cost	64	97	24
	1.7	Further issues:	29	38	34

		Yes	**No**
2.	Would you appreciate more advice?	153	28
3.	Do you use traceable calibration for humidity?	130	55
4.	Would you like more information on traceable calibration?	147	38

5.	Would you find it useful to have a Code of Practice to define terms and good practice?	**Yes / No** 178 9
6.	Is international acceptance an issue for your company?	**Yes / No** 137 49
7.	Would you like more information about the proposed Code of Practice?	**Yes / No** 177 11
8.	Would you like to contribute?	**Yes / No** 57 113

9. Please circle whichever most nearly describes your business:

User of humidity instruments	**Hygrometer manufacturer or supplier**	**R&D**	**Calibration laboratory**
111	30	30	17

A number of respondents added written comments - particularly to Question 1.7 "Further issues". All those who rated further issues as a high priority specified what these issues were. The following issues were mentioned (again in no particular order):

Quality
Reliability
Stability
Interchangeability
Durability and lifespan
Ease of use
Ease of calibration (perhaps in service)
Performance at high temperatures
Resistance to contamination
Mounting arrangements
Readout/output
Customer support
Availability of spares
Clarity of error sources
Traceability to mass standards

4 SIGNIFICANCE OF RESULTS

The survey showed a clear demand for a Code of Practice for humidity measurement, with 94% of respondents saying they would find this useful. Interest was expressed in the various categories of information at a rate of between 68% and 81% for each question.

Generally speaking, selection of a type of instrument, measurement performance and calibration were rated as high priorities. Choice of supplier and cost were generally given medium priority. Further issues were only cited by a fraction of respondents, and covered diverse subjects, but were clearly considered important by those who mentioned them.

The replies showed quite widespread use of traceable calibration (used by 68%). Despite this level of awareness, most of these expressed a need to know more about traceability. Interestingly, a small number of respondents reported that they were carrying out humidity measurements without the benefit of traceability but did not feel they needed more information about traceable calibration. In fact it could be argued that the latter group might be in greatest need of such information.

5 ACTIONS INDICATED BY THE QUESTIONNAIRE RESULTS

First and foremost, the questionnaire results provide a strong mandate in support of creating a Code of Practice for humidity measurement. This confirms the need to undertake this task.

The questionnaire results demonstrate the emphasis that users place on various issues in humidity measurement. This can be borne in mind in writing the Code of Practice document. The further issues raised by respondents provide a useful indication of users' specific concerns, which can also be addressed in the Code.

The importance placed by respondents on international acceptance is acknowledged and such acceptance will be sought through consultation with those active in the field of humidity measurement in a number of organisations overseas. The Technical Panel is in dialogue with the British Standards Institute (BSI) to see whether some use could be made of the Code of Practice in updating existing standards documents. Opportunities are also being pursued for the Code to be considered for recognition by the Instrument Society of America (and hence by the American National Standards Institute, ANSI). However the main priority remains the production of an accessible guidance document within a short space of time.

Those respondents who expressed a wish for more information about the Code of Practice will be supplied with a copy (free of charge) when it is published. In the meantime they will be invited to subsequent open meetings where they can continue to take as close an interest as they wish.

Those who offered to contribute to the creation of the Code of Practice have in many cases already begun to do so. Many of these have attended the first open meeting, and others have sent comments by letter. A number have supplied details or copies of reference texts which they consider to be useful. These supporters can be considered as "corresponding contributors" to the Code of Practice. This group will form the basis for a distribution list for drafts of the Code of Practice to be circulated for comment. They will be encouraged to provide feedback to ensure that their awareness of user needs is used to best advantage in making the Code a useful and accessible document. In the meantime it is proposed to circulate this group of "correspondents" with a copy of the results of the questionnaire, to sustain their interest and awareness. This group may also be approached with a further questionnaire if this is felt necessary at a later stage of the project.

Finally, the silent majority who did not respond to the questionnaire may not have been entirely bypassed by the exercise. Press releases and promotion of the Code of Practice by the Humidity Panel will continue to reach this audience, whose awareness may have been raised even though they did not return the questionnaire.

APPENDIX 1

Humidity Code of Practice

Questionnaire

Please complete and return by 25 November 1994 to: Stephanie Bell, National Physical Laboratory, Queens Road, Teddington, Middlesex, TW11 0LW or respond by fax on 0181-943 2945.

INSTITUTE OF MEASUREMENT & CONTROL
87 Gower Street,
London WC1E 6AA
Telephone: 071-387 4949
Telex: 946797 PRONTO G
Facsimile: 071-388 8431
Registered Charity Number 269815

What are the important issues in selecting and using humidity measurement?		*Priority* High	Medium	Low
1.1	Selection of a type of measurement	☐	☐	☐
1.2	Selection of a suppplier	☐	☐	☐
1.3	Measurement performance	☐	☐	☐
1.4	Calibration certificate	☐	☐	☐
1.5	Cost	☐	☐	☐
1.6	Life time cost	☐	☐	☐
1.7	Further issues:	☐	☐	☐

2.	Would you appreciate more advice?	Yes / No
3.	Do you use traceable calibration for humidity?	Yes / No
4.	Would you like more information on traceable calibration?	Yes / No
5.	Would you find it useful to have a code of practice to define terms and good practice?	Yes / No
6.	Is international acceptance an issue for your company?	Yes / No
7.	Would you like more information about the proposed Code of Practice?	Yes / No
8.	Would you like to contribute?	Yes / No

9. Please circle whichever most nearly describes your business:

User of humidity instruments | Hygrometer manufacturer or supplier | R&D | Calibration laboratory

Company name and address:

Contact name:

INSTITUTE OF MEASUREMENT & CONTROL
87 Gower Street,
London WC1E 6AA
Telephone: 071-387 4949
Telex: 946797 PRONTO C
Facsimile: 071-388 8431
Registered Charity Number 269815

FIELD(company)
FIELD(add1)
FIELD(add2)
FIELD(add3)
FIELD(add4)
FIELD(add5)
FIELD(postcode)

Attention of FIELD(name)

Dear FIELD(person)

We are circulating this letter and questionnaire widely to generate awareness of a collaborative project within the humidity industry. If you have already received a copy from another source please excuse this duplication.

At an exploratory meeting at the National Physical Laboratory, earlier this year, more than forty experts in the field of humidity measurement found that there was a need for a Code of Practice so that industry could use agreed terms and had a common understanding of what constitutes good practice.

The Department of Trade and Industry's National Measurement System Policy Unit (NMSPU) has agreed to fund a project in which the NPL will prepare a document with the guidance of a humidity Panel and endorsement by the Institute of Measurement & Control.

The Panel includes senior representatives of the leading UK humidity instrument manufacturers, suppliers, calibration laboratories and users of humidity measurements. We intend to collaborate with the full UK industrial humidity community via surveys, open meetings and invitations to contribute.

This survey is your initial chance to contribute to the Code of Practice and to keep up to date with progress. If you want to contribute further please indicate at question eight and we will get in touch with you.

If you have any questions please do not hesitate to contact either: Stephanie Bell at NPL on 0181-943 6402 or Michael Scott(Chair of the Panel) on 0223 870967.

Yours sincerely

Michael J Scott

Humidity Panel Chairman