

Measurement of liquid flow in open channels —

Part 3: Stream flow measurement —

Part 3Q: Code of practice for safe
practice in stream gauging

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Industrial-process Measurement and Control Standards Policy Committee (PCL/-) to Technical Committee PCL/3, upon which the following bodies were represented:

- Clyde River Purification Board
- Department of the Environment
- Department of the Environment for Northern Ireland
- Institute of Measurement and Control
- Institution of Water and Environmental Management
- National Rivers Authority
- Water Services Association of England and Wales
- Welsh Office

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- GAMBICA (BEAMA Ltd.)
- Water Research Centre

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Foreword

This Part of BS 3680 has been prepared under the direction of the Industrial-process Measurement and Control Standards Policy Committee.

This standard is one of a series of Parts of BS 3680-3 on stream flow measurement.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

0.1 The Health and Safety at work etc. Act 1974 [1]

0.1.1 This code of practice has been prepared with particular regard to the Health and Safety at work etc. Act which makes provision for securing the health and safety and welfare of persons at work and for protecting other persons against risks arising from the activities of those at work.

0.1.2 The Health and Safety at work etc. Act is clear on the general duty of employers to ensure “so far as is reasonably practicable” the health, safety and welfare of employees and Section 2 of the Act specifies the extent of this duty. It includes, for example, the following:

- a) provision and maintenance of plant and systems that are so far as is reasonably practicable, safe and without risk to health;
- b) provision of relevant information, instruction, training and supervision;
- c) the maintenance of the workplace and working environment in a safe working condition and without risk to health.

0.1.3 Section 7 of the Health and Safety at work etc. Act deals with the duty of employees themselves with respect to health and safety and this provision is relevant to much of the work covered by this standard. Two aspects are highlighted:

- a) the duty to take reasonable care for the health and safety of oneself and other persons likely to be affected; and
- b) the need to cooperate with one’s employer in carrying out any requirements of the Act.

0.2 Relevance of the Health and Safety at work etc. Act to stream gauging

Hydrometric field work encompasses a variety of tasks which often need to be carried out in potentially hazardous conditions and locations. Often the field worker will be unaccompanied and the guiding principle in these circumstances should be to exercise proper care and to avoid risks. In short, the single handed field worker should at all times approach his or her work bearing in mind common sense rules of safety.

0.3 Personal responsibility

The aim of this standard is to assist field workers to carry out gauging tasks in a safe and responsible manner. No guidelines or instructions however comprehensive can entirely replace the element of personal responsibility or the need to exercise mature judgement. One should always be satisfied that the programme of work can be undertaken without unreasonable risk to oneself or others and precautions should always be adopted with this in mind. If prevailing conditions make the intended task hazardous then the work should be discontinued and the appropriate manager/supervisor informed accordingly.

1 Scope

This Part of BS 3680 gives recommendations for the safety precautions and procedures that should be observed in the operation and maintenance of river gauging stations and in the variety of tasks associated with the measurement of level and flow in open channels. It has been recognized that, in addition to the published standards defining correct hydrometric techniques in this field, there is a need to provide clear guidelines on safe working practice for those organizations engaged in field hydrometry or work on inland waters where the general safety instructions in force may not always specify the functions uniquely related to river gauging. To this extent therefore, this standard should be seen as a supplement to the established procedures.

Much of the work covered by this standard is, of necessity, carried out in close proximity to deep and/or fast flowing water and frequently requires operating from floating vessels or entry into watercourses. Consideration is also given to the fact that such tasks are rendered more than usually hazardous if, as is often the case, the remote nature of a site means that assistance may not be readily available in the event of an emergency.

2 References

2.1 Normative references

This Part of BS 3680 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this British Standard only when incorporated in it by updating or revision.

2.2 Informative references

This Part of BS 3680 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 General considerations

3.1 Planning and preparation

3.1.1 *Work schedules and logs*

River gauging, in common with many other hydrometric tasks, often involves, of necessity, working alone at remote locations and possibly outside of normal working hours. Continuous contact with one's office or base may not always be possible and there is always a risk that even a minor accident or incapacity may develop into a serious situation if loss of mobility prevents aid being summoned. It is important therefore to ensure, before departing, that a schedule covering the period of intended absence is filed or displayed at the base for reference by colleagues or supervisory staff.

The schedule should, as far as possible, itemize all locations to be visited together with the anticipated time of arrival and duration of each visit.

3.1.2 *Reporting in*

A routine should be followed of reporting in at pre-arranged times during the working day. It should of course be sufficiently flexible to suit the nature of the workload and conditions. If radio or car telephone equipment is not available the routine should at least allow for one telephone message to base around midday. Any significant departure from the schedule should also be communicated back as soon as possible. Whatever arrangement is operated it should ensure that any unexpected or unexplained failure to return to base or to the person's home is noted within a reasonable period of time by the base office. This should ensure that effective action is taken should any search or recovery procedure prove necessary. For this purpose, members of the gauging technician's family or household or other nominee should hold the names of key supervisory personnel.

3.1.3 *Working alone at remote locations*

The following additional points should be considered:

- a) a detailed route plan, filed with the schedule;
- b) a reliable weather-forecast covering the duration of the schedule;
- c) tide tables, in cases where stations are situated on estuaries or tidal channels;

- d) any special survival equipment (see also 3.2);
- e) any requirements for notifying other organizations (e.g. Army, Police, Rescue bodies) of the person's schedule.

3.1.4 *Working at night or under adverse weather conditions*

Work involving entry into watercourses should never be attempted single-handed during the hours of darkness or in conditions of poor visibility. Personal equipment should always include a powerful and serviceable hand-torch and spare batteries. Field work should never be undertaken alone in situations where reduced visibility coupled with waterlogged ground, snow, ice or heavy rainstorms render conditions unusually hazardous. At such times the decision to continue has to be at the discretion of the person in the field. Special care should always be exercised at times of electrical storms.

One should also be aware of the additional hazard of fatigue attending long periods of work at night or in poor weather.

3.1.5 *Entry onto private land*

The operation and maintenance of permanent gauging stations are usually subject to established procedures and formal agreements with relevant land-holders, but contact should be maintained to ensure that arrangements are up-to-date and that the parties concerned are able to fulfil their obligations under the Health and Safety at Work etc. Act. Special care should of course be exercised in the case of sites which may be visited only once or at best very infrequent intervals. For such occasions one should have recourse to a comprehensive check-list of points to consider before undertaking the visit. The check-list should cover the following.

- a) Provide the owner/occupant with adequate notice of your visit.
- b) Report to the occupant or responsible person on arrival at and departure from the site.
- c) Adhere fully to any advice or instructions with respect to excluded or restricted areas and any safety or security procedures. Special requirements will often apply in the case of agricultural (e.g. in cases of outbreaks of notifiable animal diseases), industrial and commercial property and there will be strict procedures to be observed concerning entry to military establishments.