

Comparison of current Australian Standard with updated ISO standard

Current Australian Standard	AS 3778.6.4	Measurement of water flow in open channels Part 6.4: Measuring devices, instruments and equipment – Echo sounders for water depth measurements
Updated ISO Standard	ISO 4366.1979 Second edition 2007-05-15	Hydrometry — Echo sounders for water depth measurements

High-level comment on differences

The AS was reviewed 21 years ago and the ISO standard was last reviewed 14 years ago. The AS standard is based upon outdated analogue technology and the ISO standard provides more up-to-date information but is still outdated with regards to data storage, display, reports and recording mediums.

My view is that Echo sounders are not generally used in mainstream hydrometrics for the determination of measuring water depth. I am aware that Echo sounders have been used as a secondary source for determining depth where the river bed is shifting rapidly as well as for river bed sediment transport assessments. The depth measurements derived from Echo sounders can be used in combination with velocity measurements to determine flow. However in my opinion this methodology would only be adopted on rare occasions and similar results could be obtained by using the latest ultrasonic flow devices which are covered in ISO 6416:2017.

In my opinion the Standard AS 3778.6.4 (ISO 4366.1979) is not relevant as a Hydrometric Standard for the measurement of water depth. If Echo Sounders are used for unique investigations on rare occasions then other Standards such as the “International Hydrographic Organisation (IHO) standards for Bathymetric Surveys (S-44)” are more relevant.

If this recommendation is not adopted due to general consensus then the alternatives are: -

1. Adopt the ISO standard in its entirety with the understanding that it does refer to outdated analogue technology but is adequate to obtain useful information such as principles of operation and expected likely errors.

or

2. *further work will be required to adapt the ISO for an updated AS (non-preferred option, exceptional cases only)*

Reviewer recommendation

I recommend that the technical committee

- *accept the updated ISO in full to replace current AS*

(This recommendation was reached following further discussion with Working Group members)

<i>options</i>
• <i>accept the updated ISO in full to replace current AS (simplest option!)</i>
• <i>reject the updated ISO and withdraw the current AS (in cases where the update is not appropriate for Australian practice)</i>
• <i>reject the updated ISO and re-confirm the current AS without change (an alternative option in cases where the update is not appropriate for Australian practice)</i>
• <i>further work required to adapt the ISO for an updated AS (non-preferred option, exceptional cases only)</i>

Detailed summary of differences

The table below outlines in more detail a summary of the differences between the current Australian Standard under review and the relevant updated ISO standard and includes reviewer comment where relevant.

Column 1: Identifies the number and name of the section in the current Australian Standard

Column 2: Classification of the change for that section. Classified as either:

- **No change (green shading)** – The updated ISO is the same as the current Australian Standard.
- **Minor change (blue shading)** – Changes that have minimal impact on the outcome, including
 - minor format, style or heading changes
 - minor additions, removals or changes to a few words or clauses
 - addition or exclusion of more detailed explanation
 - very minor changes to steps or processes.
- **Significant change (orange shading)** – Changes that have a moderate to major impact on the outcome, such as
 - Changes to requirements
 - Significant changes to calculations, steps or processes.

Column 3: More detail to describe the change, and comment from the reviewer (enough detail for the consideration of AHA and WaMSTeC members in their review).

Text colour is used in this column as follows:

- **Black text** – More detailed explanation of the changes and reviewer comment. **Specific reviewer comment on the changes highlighted in yellow.**
- **Blue text** – reference to information included in the updated ISO that is not in the current Australian Standard
- **Red text** – reference to information included in the current Australian Standard that is not in the updated ISO.

Section (AS section number)	Classification of change AS to ISO	More detail and comment on changes in the updated ISO
Table of Contents (TOC) All Sections	Adopt ISO TOC (see authors comments at the beginning)	AS Table of contents completely different from ISO – ISO Table of Contents is more relevant and complete.
All Sections	Adopt ISO (see authors comments at the beginning) Or Remove Standard (initial recommendation)	<p>AS is based on outdated analogue technology. The ISO standard is more relevant however it could be improved/updated with new information based on new technology. I question whether the expertise for this technology lays with other disciplines rather than the hydrometric industry eg oceanographic hydrographic surveyors.</p> <p>I accept that echo sounders have been used on rare occasions to determine water-levels for rivers with shifting stream beds but the primary use is in the marine industry. In these cases the relevant information on “standards” can be obtained from the product manual as well as from the IHO Standards (S-44).</p> <p>My initial recommendation is to remove this Standard from the 3778 series.</p>