



Environment
Agency



Broads
Authority



ASSOCIATION OF
INLAND NAVIGATION
AUTHORITIES

Boat Safety Standards Setting Forum

Impact Assessment of the proposed smoke alarm Boat Safety Standards

This document concerns the proposal to introduce new Boat Safety Standards and Boat Safety Scheme Examination Checks for a correct number of suitable smoke alarms in good condition on all classes of boat with accommodation spaces

December 2025

1. Intervention & Options

The Boat Safety Standards Setting Forum (BS SSF) comprises of three navigation authorities' (the Canal & River Trust, the Environment Agency and the Broads Authority) works on behalf of their respective navigation authorities concerning boat safety standards.

It has standing invitations to stakeholders to participate, include a representative from the Association of Inland Navigation Authorities (AINA), the conveners of the Boat Safety Scheme (BSS) Technical Forum and Forums, as well as user, marine trade and BSS Examiner representatives.

BS SSF members meet to agree and keep under review, common Boat Safety Standards. This is carried out by taking account of recommendations from BSS Limited and its stakeholder forums , The BS SSF also has a role to hearing any statutory appeals against the Standards.

Proposals for the introduction of adding smoke alarms to all classes of boats.

In the past two years the BSS has collated evidence that indicates smoke alarms are an effective intervention in reducing the potential for a fire on a boat to spread to adjacent boats and harm other property.

From the recent evidence compiled and collated, we draw together data indicating up to 1 in 16 boat fires on waterways where the Boat Safety Standards apply, result in more than one boat being damaged.

The Forum's conclusion is, that given the relatively tiny amount of investment it takes to buy and install smoke alarms on boats, the reduced risk to neighbouring boats and property the mandate offers, is significantly beneficial. This understanding brought the need for action into focus.

1.1 What is the problem under consideration and the purpose of the proposals?

- 1.1.1 The risk to be mitigated is that of fire starting and going unnoticed until it is past the point of control, or that property adjacent to the boat catching fire, can be moved in a timely way, to reduce the potential harm.
- 1.1.2 The introduction of smoke alarms as a mandatory standard for commercial or community operated craft with accommodation spaces. If fire breaks out on the boat, then alarms will help to protect any people invited aboard such boats that may be used as, but not limited to these examples, hotels, retail premises, galleries, museums or for community and charitable purposes etc.

1.2 What are the intended effects?

- 1.2.1 The proposed changes to the Boat Safety Standards, and consequently the Boat Safety Scheme (BSS) requirements, are to help reduce the potential for a fire on a boat to spread to adjacent boats and harm other property.
- 1.2.2 Only boats subject to the BSS will be affected, namely around 87,000 vessels on the UK's inland waterway network. Note, around 3,000 self-drive hire boats are already required to have suitable working smoke alarms installed.

1.2.3 The enhanced protection will also help protect first-responders / emergency services, BSS Examiners or other workers on, or in the immediate vicinity of boats. The fires should be much less involved at the point of first response and/or people working nearby can evacuate the immediate area and help other people close to the boat move to a safe distance away.

1.2.4 The additional recognised benefit beyond the regulatory target is based on the documented effectiveness of smoke alarms activating when fire breaks out on a boat. The alarm may help prevent the death of, or injury to, boat owners in their own boats by alerting them to escape before succumbing to hot toxic fumes, or being trapped by a rapidly developing fire.

1.3 What policy options have been considered?

Three options have been considered: do nothing, ask the BSS to introduce an Advice check only, rely upon continued campaigning only.

1.3.1 'Do nothing' – this was considered but rejected as the evidence collected during the development of the BSS Risk Review and Assessment Paper is compelling and the BSS and Navigation Authorities would be exposed if no regard was paid to the evidence, and if the BSS disregarded the advice from its stakeholders who strongly support the proposals.

Relying only on safety campaigns have proven to have had partial success. A BSS survey of voluntary smoke alarm installation (Sep 2021-Sep 2022) found that nationally, 46% of boats had one or more working smoke alarms. (broken down by navigation authority: Canal & River Trust 53%, Environment Agency 25%, Broads Authority 23%) [[Link to smoke alarm surveys](#)]

The 2019 introduction of mandatory CO alarms saw adoption rise from 68% to 92% in two years. We anticipate a similar pattern of adoption in smoke alarms if mandatory standards are introduced

1.3.2 Introduce BSS 'Advice Checks' for privately owned, managed and used boats – considered inappropriate because the risk falls within the criteria for mandatory Boat Safety Standards and BSS Requirements, i.e. the protection of people and property from the systems and behaviours aboard boats.

1.3.3 [Preferred option] Introduce mandatory new Boat Safety Standards supported by new BSS Requirements - the risk falls within the criteria for mandatory Boat Safety Standards, the risk review supports this outcome, and this option has full support from all BS SSF and BSS stakeholder representatives.

1.4 When will the implemented policy be reviewed

1.4.1 The monitoring of the actual costs and benefits, and the achievement of the desired effects, will be carried out quarterly and annually. Monitoring will take place in the Boat Safety Standards Setting Forum (BS SSF). Stakeholders participating in the BSS Technical Forum will also monitor any impact on the risk-pictures. Any unexpected cost and operational effects will be monitored by the BSS Advisory Forum and fed back to the BS SSF.

2. Analysis and Evidence

2.1. Costs and benefits of introducing the proposals

2.1.1 Who will be affected and how? The impact will fall on the owners and operators of all boats with accommodation spaces used on the inland waterways, specifically those waterways controlled by navigation authorities that have adopted the BSS Requirements and Certifications.

2.1.2 It does not affect the owners or operators of vessels without accommodation spaces, such as open day boats.

2.1.3 Other groups affected include:

- the navigation authorities who have adopted the Boat Safety Scheme concerning their enforcement role;
- BSS Examiners for training in the proposed changes;
- chandlery and online shops selling smoke alarms, in-house fitters or those marine service agents contracted in by owner/operators;
- insurance providers concerned with insuring inland waterway vessels.

2.1.4 Only the costs concerning the preferred option are provided, because:

- all boat owner and marine trade representative bodies, whose membership are subject to the proposed new BSS Requirements, strongly support the proposals;
- the cost burden associated with the proposals is seen as entirely proportionate to the risk benefits gained;
- the risk benefits of the proposals are potentially extremely significant.

2.1.5 It is proposed to achieve the objectives by introducing a general new mandatory standard for an adequate number suitable, working smoke alarms in good condition, which will be supported in verification by mandatory new BSS Requirements and four BSS Checks for suitable smoke alarms in good condition and in suitable locations on all classes of boat with accommodation spaces from 1 October 2026

The details are available to view and download from the dedicated consultation website. The proposals are considered essential to support the purposes of navigation and harbour authorities having common Boat Safety Standards to underpin their duties of care.

2.1.6 The proposed new BSS Requirements will follow most of the criteria of the existing hire boat requirements for smoke alarms, namely:

- Smoke alarms must be marked as being certified by an accredited third-party body as meeting EN 14604 or equivalent.
- Smoke alarms must be ceiling-mounted or wall-mounted between 150mm – 300mm below the ceiling height.
- Alarms must be provided with a test function button.

2.1.7 The following assumptions are presented as of December 2025:

- a. Approximately 90,000 boats are subject to the BSS in any four-year period. Extracting the numbers of hire boats and non-private boat classes (combined 3,100) So, based on a national average as found by the BSS in its survey on the use of smoke alarms in boats, there will be of 52% of 86,900 boats in scope having no suitable smoke alarm in good condition installed. This equates to 45,188 private boats affected.
See full details of BSS survey on smoke alarm usage on this link www.boatsafetyscheme.org/about-us/consultations-reviews/smoke-alarm-surveys/
- b. Note: the figure of 52% accounts for 2% (1800) of boats had alarms but were not working. We have no indication as to the reason the alarm failed to work when tested, such as the battery being disconnected, or the whole unit not functioning and needing replacement. But we will assume the majority only require battery replacement at minimal cost.
- c. We have assumed an alarm cost of £15 inc. VAT, as being a reasonable retail price of a battery powered EN 14604 certified smoke alarm at today's market prices for an optical sensor alarm with a 10-year expected domestic lifespan – as stated in the product details.
- d. Based on a survey of six high street, trading estate and online specialist retailers, over a third of the units meeting these criteria were retailing at between £5.92 - £15. The maximum price may exceed £100 for EN 14604 certified alarm linked to a smart control system. While not included in the survey records, it was apparent that twin and multiple alarm packs reduced the cost per unit considerably.
- e. One alarm is generally sufficient to meet the BSS minimum safety requirement. However, two or more may be required if separate accommodation spaces are separated by doors and are more than 10m from an alarm.
- f. No installation costs for private craft are taken into account because, as an optional securing method, alarms can be secured in position using strong sticky pads.
- g. The estimated 46% of boats with existing smoke alarms will mostly have alarms that will be compliant with the proposed new BSS requirement. A further 2% of non-working alarms will need batteries installing.

2.1.8 The following costs are estimated:

- a. Additional costs to boat owners/operators - £677,820 (45,188 boats x £15 each boat), this also equates to an average outlay of £2.14 per year per boat, over the lifespan of the alarm estimated as seven-years when installed in a boat. Focussing on hire operators specifically, it is estimated that there are currently around 2400 boats registered for weekly hire, which are already required to have smoke alarms. There will likely be an estimated 240 day-hire boats (10 percent) with cabins, not already having smoke alarms, brought into scope £3,600 (240 x £15 each boat), equivalent to £2.14 per year over a seven year estimate lifespan.

Additional costs to the owners of other classes of non-private boats subject to the BSS. These are the workboats, hotel boats, floating cafes, etc, estimated at around 700 boats.

It is estimated that smoke alarm uptake will likely be already high in this class being a work environment, so we make an assumption that two-thirds of the non-private fleet already have smoke alarms installed.

The total fleet cost is estimated at £3,495 (233 non-private i.e. 473 x £15 each boat), equating to a new outlay of £2.14 per year over seven years.

- b. It is anticipated that operators of the non-private classes of boat will want a more robust form of attachment beyond the use of sticky tabs. Costs are estimated at a minimum charge of around £10 per unit. Hire boats and other non-private boats - £4,730 (473 boats at £10).
- c. The total cost of compliance for a nominal 7 years is £685,045 across all boats.
- d. Will there be additional BSS Examiner charges for their boat owners/operator customers? – it is possible that examiners will charge more for the added time taken to carry out the additional checks. Examiners operate in a free market regarding their charges. However, the extra time taken to conduct the proposed checks is minimal.
- e. Additional costs to BSS Examiners – it is intended that training to the proposed new checks will take place online. As such any training costs will be minimized for BSS Examiners.
- f. Additional cost to navigation authorities - Direct cost to the Navigation Authorities may arise from any need to further consult, amend of registration, licensing or other conditions and any information to reflect the change in requirements.
- g. For organisations and individuals operating non-private classes of vessel registered with the Environment Agency, it should be noted that if the Agency is considering a change to its policies, processes or practices that have a significant financial impact on business, the Government's Accountability for Regulatory Impact scheme requires the Agency to undertake a formal Business Engagement Assessment and consult the affected business sectors. This proposed change to the BSS requirements applies to all classes of commercial vessel subject to the Scheme's requirements. The BSS considers that the overall financial impact of the changes that we propose are insignificant.

Notwithstanding this view, commercial operators are asked to make known any alternative view by providing comments into the public consultation. Your input will help the Environment Agency to decide on the need to proceed with a formal Business Engagement Assessment for these proposals.

- h. Additional costs to the BSS administration – no additional costs, only normal operating costs in support of consultation, implementation, promotion and review.

2.1.9 The following benefits are identified

- a. Full adoption of the proposals would see necessary and proportionate risk controls introduced to help reduce the risk of fire spreading due to the curtailed development of the fire to as low as reasonably practicable by the earlier attendance of the fire and rescue service.
- b. The benefits are also likely to apply to third parties such as first-responders because of a likely reduction in the numbers of attending blue light services, if the fire incidents are less developed and involving fewer boats
- c. In considering the effectiveness of smoke alarms, the BSS reviewed the incident data where smoke alarms were mentioned. Of the 60 reports (2010-2024) nearly two-thirds of incidents recorded that smoke alarms on the boats had activated. While there was no data available in 28% of the incidents, only 8% of incident recorded that smoke alarms failed to activate. The reasons for the activation failures were not recorded, so we cannot state if the cause related to missing batteries, life expiry of the alarm, other condition related issues, inappropriate location, etc.

Data linked to 60 incidents (2010-2024) of fires where records indicate that a smoke alarm was present on the boat



- d. Using this evidence, we think it reasonable to assume an estimate of 10% ineffectiveness linked to a small proportion of boaters who may not use alarms appropriately, i.e. may not replace the alarm when the battery expires etc, or failing to act upon an alarm activation, including any victims affected by drugs or alcohol.
- e. The BSS has collated documentary evidence from its records of people outside of the confines of the boat (passers-by, neighbours, etc) have heard alarms within boats and reacted by calling for help and other positive contributions that have helped reduce the harmful results of the incidents.
- f. We will consider the potential beneficial effect of mandatory smoke alarms in reducing the numbers of boats damaged when fire spreads.

Between January 2020 and December 2024, at least 90 boats on BSS implemented waterways were damaged by fire spreading from one boat to another – a mean of six boats each year. On the assumption that an ordinary domestic '10-year optical smoke alarm' meeting BS EN 16404 has a marine lifespan of seven years related to the challenging environment on boats, we will estimate that 42 boats could potentially be destroyed or damaged by fire spreading.

If we conservatively estimate that 33 percent of that 42 would not be damaged, that may mean 14 craft are no longer involved in conflagration events every seven years, or two craft per year on average.

Note: Steel boats, if they escape structural damage and only suffer exterior damage, may cost approximately £1200 for re-blackening, for professional re-painting in a controlled environment £10,000-£20,000, and for signwriting/decoration restoration £200-800

Note: FRP/GRP boats – if glass fibre boats suffer heat exposure, the gel coat becomes compromised and can crack, craze and/or delaminate from the fibre and resin structure. Effective repairs are usually unfeasible and generally grp cruisers are likely to be considered as a total loss.

In considering complete loss: used grp river cruisers range in price from around £6,000 for a navigable condition small cruiser in reasonable decorative order to over £1,500,000 for a prestige cruiser in the UK as sold through brokerages.

Used narrowboats and widebeams in navigable condition and reasonable decorative order range from around £15,000 to £300,000 through brokerages

With this price range it is not feasible to provide a cost benefit with any reasonable accuracy.

The most expensive boat the BSS has recorded as being damaged (severely) by fire spreading was a multi-million pound aluminium-hulled government fisheries patrol vessel in a coastal marina in 2023.

In addition to boat damage, BSS records also show that mooring infrastructure is damaged. This can range from simple mooring structures to complex pontoon systems complete with services and utilities. The loss to the moorings operator (club or commercial) can be considerable both in terms of replacement structures and of loss of service, reduced income and inconvenience for other berthholders and business processes.

Other property and infrastructure can also be damaged or put under threat, such as bridges and adjacent domestic or business properties. We cannot quantify this for this consultation, but there have been examples where such threats were close to being realised.

- g. Benefits that are additional to the consultation.

While the BSS has no record ever of occupants of adjacent boats being killed when fire spreads from one craft to another, this scenario is possible in theory.

However, there will be further protection to craft occupants of boats that are the source of a fire starting. On private boats, this is known as a first-party risk.

There have been 13 fatal fire incidents between 2010 and 2014, mainly on boats in residential style use (extended or intensive service). Incident investigation reports show that in the majority cases of fatal fire on boats, the chances of survival would have been potentially improved if suitable smoke alarms in working order had been present on those boats.

These are the findings in recommendations of the Chief Inspectors of the Marine Accident Investigation Branch (MAIB), National Fire Chiefs Council, individual fire and rescue services and coronial inquests.

In 2010, the UK government published a cost of a fatal fire as being approximately £1.3m, if the additional impact is one of saving a life or lives at least once every seven years (the BSS assumed life of a 10-year optical smoke alarm on a boat) then the benefit to UK society is potentially considerable.

2.2. Consultation with small business

2.2.1 British Marine representing the major part of the marine industry's small businesses, have been well represented at BSS Committees and forums. It has taken an active part in the substantial BSS discussions on the proposed changed requirements. British Marine are fully supportive of the proposals.

2.2.2 It is likely that a majority of affected boats operated by small business will already comply.

2.3. Competition Assessment

2.3.1 The proposals will not affect competition in the broader business sector.

2.4. Enforcement and sanctions

2.4.1 Enforcement of standards lie with the individual navigation and harbour authorities who have the powers, duty and responsibility for enforcement. The role of the BSS is to provide the research, risk appreciations and recommendations for new standards, amending standards and withdrawing standards. The Scheme also supports compliance through its verification and compliance services.

2.4.2 The Boat Safety Standards may be implemented by an individual navigation or harbour authority, through legislation, byelaws, or contractual conditions under which a licence/registration or other permission to use a vessel is issued or withdrawn. In most cases failure to support an application for a licence/registration or other permission with a BSS Certification will result in the permission being refused or withdrawn.

3. Further information

Further information about the proposed changes is contained within the main consultation document.

The contact point, concerning this Impact Assessment is:

The Convener

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