

DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
Washington, DC 20314-1000

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AUTO-INFLATABLE PERSONAL FLOTATION DEVICE  
FIELD TEST POLICY REQUIREMENTS  
AND STANDARD OPERATING PROCEDURES

1. Purpose. This document provides implementation guidance for the U.S. Army Corps of Engineers (USACE) Auto-inflatable Personal Flotation Device (PFD) Field Test.
2. Applicability. This guidance applies only to specific Major Subordinate Commands (MSCs) and districts having Civil Works functions approved for participation in the field test period conducted through 30 September 2006.
3. Distribution Statement. This document has been distributed to all MSCs and District Commands as an attachment to reference 4b.
4. References.
  - a. EM 385-1-1, Safety and Health Requirements Manual
  - b. Director of Civil Works Memorandum, Request for Participation, Inflatable Personal Flotation Device Field Test, dated 2 March 2006.
  - c. Director of Civil Works Memorandum, Approval for Participation, Inflatable Personal Flotation Device Field Test, date TBD.
5. Background. This policy guidance is a result of recommendations from the HQUSACE Safety Office and the Inflatable PFD Product Delivery Team (PDT), following a series of design and reliability tests.
6. Policy. USACE employees as stipulated in Paragraph 6b may be authorized to wear auto-inflatable PFD devices as specified in Paragraph 6c, in accordance with the policy guidance contained in this document. Implementation of this policy is at the option of the Major Subordinate Commander (MSC) who may delegate this authority to the District Commands. In accordance with this policy guidance, USACE employees may be authorized to wear auto-inflatable PFDs per paragraphs 6b and 6c.

a. General.

(1) EM 385-1-1 requires employees to wear PFDs for personal protection while working on, over or around water. Employees working in these environments currently are limited to inherent buoyancy PFDs (i.e., full-chest vests, float coats), as specified in the standards.

(2) Auto-inflatable PFD designs were not authorized for use under Corps safety standards. These devices previously lacked U.S. Coast Guard approval for commercial applications. However, since some models were U.S. Coast Guard approved for recreational use, HQUSACE Safety Office initiated a series of reliability tests to determine if such devices would meet Corps standards for use. Initial tests conducted by HQUSACE disclosed serious reliability concerns.

(3) In September 2005, the U.S. Coast Guard approved several auto-inflatable devices for commercial environments. In subsequent test sessions conducted by HQUSACE, three devices were found to meet Corps reliability standards. These devices carry the U.S. Coast Guard approval for commercial use.

(4) Approval of this test does not alter current standards of EM 385-1-1. Only those Corps employees specifically identified for participation in the field test will be authorized to use the subject auto-inflatable devices until further approval.

(5) The deployment and roll-over reliabilities/efficiencies have been determined in the previously conducted Safety Office testing. The intent of the field test is to further investigate the value-added with authorizing these devices for use in EM 385-1-1. The PDT will be evaluating issues such as comfort, preference of use, weather effects, procurement and maintenance costs, accountability, level of care, and other particulars learned from field reports.

b. Eligible Employees.

(1) USACE employees from the following Civil Works Business Lines are authorized to wear one of the three specified auto-inflatable PFDs for the duration of the field test:

- Natural Resource Management
- Locks and Dams
- Powerhouses
- Floating Plant
- Marine Construction

(2) Test participants must be employed at a USACE Water Resources Development Project in a permanent, seasonal or temporary position, including Coop (SCEP), Stay-In-School (STEP) and summer hire employees; and must have demonstrated ability to tread water or submit a signed waiver of proof. The US Coast Guard and the device manufacturers recommend that these devices be worn only by persons having at least the ability to tread water.

(3) Each participant must have their supervisor's written approval and agreement prior to participating in the test.

(4) Each participant must complete Appendix A, Participant's Information Sheet, which provides evaluators with general information, such as name, position, field location, and non-specific height and weight information. Additionally, information on the specific device the participant will use during the test is requested, including procurement information.

(5) Only approved test participants are authorized for this test. Substitutions of employees at any point of the test period must be approved in advance by the National Operations Center for Water Safety, to assure that proper training has been provided to each participant, and sufficient time remains within the test period to accomplish the testing parameters.

(6) Test participants must attest to and/or demonstrate satisfactory basic ability to tread water. These devices, per manufacturer's and U.S. Coast Guard recommendations, are not intended for non-swimmers.

c. Hazard Analysis Process. In accordance with paragraph 4a, References, a comprehensive Position Analysis and Activity Hazard Analysis will be developed to verify which positions/jobs will warrant authorization for test participation. These analyses must identify and address high-risk activities where substitution of auto-inflatable PFDs for inherent buoyancy PFDs should not be permitted, i.e., during welding activities or where damage to the device could diminish performance. See Appendix B, Hazard Analysis Process, for further information.

d. Approved Equipment Specifications.

(1) The following auto-inflatable PFD models are approved for the field test. Exceptions to these specific models are not authorized.

- Stearns Model #1470 with Halkey-Roberts inflator and appropriate model re-arm kit
- Mustang Model #MD3087 with Halkey-Roberts inflator and appropriate model re-arm kit
- Mustang Model #MD3183 with Hammer inflator and appropriate model re-arm kit
- ALL MODELS ACQUIRED MUST BE INTERNATIONAL ORANGE AND BEAR RETRO-REFLECTIVE TAPE AS REQUIRED IN EM 385-1-1 SECTION 05.H.01

e. Procurement of Authorized Equipment

- (1) Procurement of equipment authorized for the field test is through the manufacturers and is approved for use only by individuals identified as participants in the field test.

- Stearns Model #1470

Procurement/Vendor information: Available directly from Stearns: \$113.00/each, \$10.70 per re-arming kit. Flyer will be provided with detailed ordering information to participating offices.

- Mustang Models #MD3087 and MD3183

Procurement/Vendor information: Model #MD3087 is currently available under GSA contract (GS-07F-0065H), can be procured directly from Mustang. Model #MD3183 is pending addition to Mustangs GSA contract; during the interim, Mustang will honor GSA pricing to Corps offices wishing to procure that model. These models can purchase directly from Mustang via purchase order or Government credit card. Orders may be placed by contacting Mustang's Customer Service Staff in Bellingham, WA at (800) 526-0532 or by FAX at (360) 676-5014. Pricing for models and re-arm kits are:

MD3087 – Deluxe automatic inflatable (CG-approved for use aboard uninspected commercial vessels less than 40 feet in length) - \$116.87/each

MD3183 – Deluxe automatic inflatable with Hydrostatic inflator (CG-approved for use aboard uninspected commercial vessels less than 40 feet in length) - \$139.04/each

MA7202 – Automatic re-arm kit for deluxe inflatables (for use with #MD3087; includes 33gr CO<sup>2</sup> cylinder and actuator bobbin) - \$13.55/each

MA7214 – Hydrostatic re-arm kit (for use with #MD3183 – includes 33 gr CO<sup>2</sup> cylinder and replacement inflator) - \$36.07/each.

f. Policy Criteria on the Use of Auto-inflatable PFDs

(1) General Criteria.

(a) Only the Stearns model #1470 and Mustang models #MD3087 and #MD3183 auto-inflatable PFDs are approved for authorized test participants' use in lieu of standard inherent buoyancy PFDs during routine performance of duties on, in or around the water for the period of the test, not to exceed 30 September 2006. Other similar devices are not acceptable or approved for use at this time.

(b) Participating district or project offices will purchase as personal protection equipment for each selected employee, one of the three approved auto-inflatable PFD test models to be used throughout the test period. Care, maintenance and accountability of the auto-inflatable devices will become the responsibility of the employee. These devices will be issued as accountable property and a Property Loan receipt will be issued for control purposes; re-arming kits are expendable and therefore do not require a Property Loan receipt. Additionally, each employee will maintain documentation registering device cost, wear, deployment, maintenance, part replacement, and other information important to the evaluation

process. A sample documentation form is provided with this SOP; see Appendix C, Auto-inflatable PFD Reporting.

(c) Participating districts and/or projects are asked to utilize all three types of approved test models at their facility, to ensure adequate information is available for final approval consideration. A minimum of six employees is required of any district wanting to participate; maximum numbers of participants is at the discretion of the district, as long as all participants are properly trained and meet other criteria specified herein.

(d) Test participants will be trained in use, maintenance and general care of their auto-inflatable PFD. Training will be assisted by the National Operations Center for Water Safety.

(e) Employees involved in boat operation duties or otherwise working in, on, or around the water should be assigned in at least pairs, following current standard operation procedures.

g. Guidelines for Use

(1) In addition to Corps HQUSACE Safety Office guidance, the U.S. Coast Guard and device manufacturer's instructions and industry training for use, care and storage of the auto-inflatable PFDs must be followed.

(2) Each test participant will be personally responsible for the care, security and maintenance of his/her Corps-procured auto-inflatable PFD.

(a) A system of routine visual inspections of the device, particularly before use, should be established. Maintenance inspections and information reporting are key parts of the test, as they provide important QA/QC information for review. Maintenance inspections should be conducted no less than once per week throughout the test period and results noted on the report form.

(b) Maintenance activities should include inspection of the CO<sup>2</sup> cartridge, as well as the cartridge device, inflatable bladders, break-away closures, manual pull cords, and durability of the fabric. All maintenance activities of the device, including these visual inspections, CO<sup>2</sup> cartridge replacement, storage, and repackaging, are to be noted on the report log and provided to the PDT at test end. Note that the report form requests temperature and humidity information in addition to other data.

(c) Incidents of deployment, other than those occurring during training, are particularly important to report and circumstances leading up to deployment, as well as device effectiveness after deployment must be explained on the report form. Information requested includes the body type and weight range of the test subject, as well as an estimate of deployment and roll-over response times. Any test device is approved for use in interpretive/educational outreach settings, but such use should be noted on the report form, particularly any device deployments and results of such.

(d) Following any incident of deployment, the auto-inflatable device should be properly repackaged, re-armed and ready for use. Participants will be trained in the steps required to prepare the PFD for reuse, including:

- General device inspection (bladders, deployment device, cords, breakaway closures)
- Installation of a fresh CO<sup>2</sup> cartridge
- Properly drying the internal bladders of the device before repackaging
- Folding bladders properly and securing breakaway closures (Velcro or zipper)
- Assuring green "ready" indicator is viewable through device window

(e) Auto-inflatable devices are not approved, even for the purposes of this test, for work environments where damage to the equipment might occur. An example of this would be use of the device where welding is occurring, as the device bladders could be damaged by welding slag. Consideration to the work environment is an important part of the Activity Hazard Analysis.

(g) The three auto-inflatable PFDs approved for this test are designed to discharge the CO<sup>2</sup> cartridge and fill with air automatically within 5 seconds of immersion in water. The models have back-up manual pull cords for inflation in the event the automated device fails. Participants will be trained in both the automatic and manual inflation techniques, as well as the mouth inflation feature that will aid in flotation following deployment.

(h) Proper care and storage of the device will be the responsibility of the participating employee, and record of such will be noted on the report forms. This information is important to provide evaluators with care and storage requirements of standard issued inherent buoyancy life jackets.

#### h. Recordkeeping/Reporting.

(1) Forms for recording procurement, maintenance, deployment and other activities associated with use of the auto-inflatable devices are provided in Appendix C, Auto-inflatable PFD Reporting. Forms are self-explanatory, with completion instructions provided. Documentation requirements will be part of training provided to each participant.

## APPENDIX A

### AUTO-INFLATABLE PERSONAL FLOTAION DEVICE FIELD WEAR TEST PARTICIPANT'S INFORMATION SHEET

A-1. General. Employees must submit general personal information, proof of supervisor's approval for participation in field test, swimming skill level documentation, and procurement information about the selected auto-inflatable device to be used during test period. This information shall be provided on the "Participant's Information Sheet" attached.

a. Supervisor's approval for participation is mandatory.

b. Each employee should select only one device for testing.

c. Each employee must demonstrate an acceptable level of ability to tread water, meeting in particular standards outlined in the Motorboat Operator's Licensing Course. In lieu of performing a live demonstration of skill, optional documentation may be provided (certificate or other notice from water safety instructor, boat training instructor, etc.) A signed waiver of proof may be accepted on a case-by-case basis. Lack of proper documentation may result in exclusion from the test.



**AUTO-INFLATABLE PERSONAL FLOTATION DEVICE WEAR TEST**  
**PARTICIPANT'S INFORMATION SHEET**

Employee Name: \_\_\_\_\_

Duty Station: \_\_\_\_\_

Job Title: \_\_\_\_\_

Personal information:

M \_\_\_\_\_ F \_\_\_\_\_

**Height:**

Less than 5'5" \_\_\_\_\_ 5'6" – 5'9" \_\_\_\_\_ 5'10" – 6'2" \_\_\_\_\_ Greater than 6'3" \_\_\_\_\_

**Weight:**

Less than 120# \_\_\_\_\_ 121–149# \_\_\_\_\_ 150-200# \_\_\_\_\_ 200-250# \_\_\_\_\_ Greater than 250# \_\_\_\_\_

**Select which device this employee will test:**

Stearns Model #1470 \_\_\_\_\_ Mustang Model #MD3187 \_\_\_\_\_  
Mustang Model #MD3183 \_\_\_\_\_

**Procurement information:**

**Auto-inflatable device**

**Vendor:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Unit Cost:** \_\_\_\_\_

**CO2 cartridge/re-arming kits:**

**Vendor:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Unit Cost:** \_\_\_\_\_

**Ability to tread water: Discussed between employee and supervisor and accepted**

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**Supervisory approval for participation in field test.**

**Supervisor's name (print):**

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**Contact information:**

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**Signature:**

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## APPENDIX B

### HAZARD ANALYSIS PROCESS

B-1. General. The following documents provide sample guidance to assist districts and project offices in conducting a Position Hazard Analysis and associated project Activity Hazard Analysis as per EM 385-1-1, Safety and Health Requirements Manual.

- a. Position Hazard Analysis. A Position Hazard Analysis (PHA) must be prepared to identify the positions and duties (district-wide) that may warrant the temporary use of auto-inflatable life jackets during the test period not to exceed September 30, 2006, unless otherwise authorized. This process must identify all positions with duties that occur on, over or around water considered appropriate for inclusion in an auto-inflatable life jacket field test.
- b. Activity Hazard Analysis. Managers who have employees identified in the *Position* paragraph of the PHA must prepare a project Activity Hazard Analysis for each duty listed in the PHA. The AHA will address activities associated with each position identified as appropriate for inclusion in the field test.

**SAMPLE ACTIVITY HAZARD ANALYSIS**

ACTIVITY: Auto-inflatable PFD Test ANALYZED BY/DATE:

REVIEWED BY/DATE:

PRINCIPAL STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS
Using auto-inflatable PFD during work	<p>Device improperly worn or assembled</p> <p>Device damage from work</p> <p>Device Damage from storage</p> <p>Discharge – equipment defect</p> <p>Drowning</p> <p>Device inoperable due to discharge</p>	<p>Employees shall follow manufacturer’s instructions for wearing, assembling CO2 cartridge mechanism, and pre-work inspection of PFDs</p> <p>Do not expose auto-inflatable device to work environment that has potential to cause device damage such as welding slag, sharp objects, punctures, solvents, crushing, etc.</p> <p>PFD shall be stored according to manufacturer’s recommendations when not in use – PFD shall not be exposed to excessive moisture, crushing, extreme heat, etc. while stored.</p> <p>Devices shall be worn and used properly – if a PFD inflates when wearer is not immersed it may cause injury or an accident. If such an inflation occurs, it shall be reported to the supervisor and to the National Operations Center for Water Safety for possible action on a national level.</p> <p>All auto-inflatable PFD users shall have basic ability to tread water and must be physically able to swim while wearing these PFDs. Persons with injuries or illnesses that temporarily or permanently prevent them from being able to swim shall not use auto-inflatable PFDs for the duration of the illness or injury.</p> <p>Offices that issue auto-inflatable PFDs to employees shall maintain an adequate number of recharging kits for the CO2 cylinders. Employees shall be instructed on how to obtain a recharge after deployment. Devices shall not be used until recharging.</p>

## APPENDIX C

### AUTO-INFLATABLE PERSONAL FLOTATION DEVICE FIELD TEST ACTIVITY RECORD AND RECORD OF DEPLOYMENT

C-1. General. The following forms are to be used for documenting routine use and/or maintenance activities, an essential element of the field wear test. As explained in policy guidance, each participant will establish a routine of visual inspections of the device and make appropriate notations to this record. Maintenance inspections and information reporting are key parts of the test, as they provide important QA/QC information for review. Maintenance inspections should be conducted no less than once per week throughout the test period and results noted on the report form.

a. Record information should include dates of use, activity when used, whether the device deployed during use, any maintenance performed (inspection of the CO<sub>2</sub> cartridge, inflatable bladders, break-away closures, and manual pull cords). Deployments, whether intentional or accidental, automatic or manual, should be noted on the maintenance record; additional information providing additional information specific to the deployment incident should then be documented on the form "Record of Deployment". Note that the report form requests temperature and humidity information in addition to other data.

b. Incidental deployment of the device should be noted on the "Record of Deployment" form, providing specifics related to why the device deployed. This form is to be completed for each incident of deployment, including demonstration deployments and accidental deployments.



