EXECUTIVE SUMMARY

USCG Grant 1002.31

Development of Requirements for Risk-Based Assessment and Classification Methodology for Personal Flotation Devices: Phase V of a Multi-Phased Plan

Phase V of this five (5) phase development process builds on four years of previous effort as a key element for improving lifejacket/personal flotation device (PFD) classification and flexibility in the standards for PFDs. The Phase V effort was the finalization of the Risk-Based Assessment and Classification Methodology related to the work conducted under the USCG Grant process. Other activity towards implementation of the Risk-Based Methodology will continue under an effort funded by the PFD Industry with input from the Standards Technical Panel of UL.

Phase I, Phase II, Phase III, and Phase IV overviews are as follows:

Phase I (USCG Grant 1602.30): In the first year, key PFD design performance details were identified and evaluated through an extensive series of calm and wave tank experiments with a broad range of lifejackets/PFDs and through an expert elicitation workshop;

Phase II (USCG Grant 1702.32): In phase II, the needed PFD test cases were identified; data collected from manufacturers to test the risk analysis model and to perform preliminary calibration of the model for the classification of PFDs, and an Expert-Opinion Elicitation Workshop was conducted to examine data collected and results obtained from the use of the model.

Phase III (USCG Grant 1802.31): A technical basis document for future PFD standards was provided by showing models for PFD performance and classification under a Report of Personal Flotation Device Risk and Reclassification Analysis (PFDRRA). The PFDRRA models consist of three recommended computational procedures for inherently buoyant, inflatable and hybrid PFDs.

Phase IV (USCG 1902.29): Three documents were provided as summarized below.

Document No. 1 – "PFD Calm Water Testing Data Summary"

The anticipated data collection was completed and is shown in the EXCEL spread sheets entitled "PFD Calm Water Testing Data Summary". The data consists of testing a variety of Personal Flotation Devices on one subject having a 12 Lb. in-water weight with limited testing on a second subject of similar in-water weight and anatomy. The typical in-water performance characteristics were determined in conjunction with new test methods for Heave Period and Push Down/Pull Up Force examinations.

Document No. 2 – "PFDRRA Elicitor Report"

This report covers an Expert-Opinion Elicitation Workshop as previously described under Phases II and III. The workshop under phase IV was conducted to examine the PFDRRA model in previous studies and expand the applicability from adults to children and infants, and update the adult model parameters. Additionally, the workshop examined the heave period testing of PFD-human systems, and working group results on PFD principles and requirements towards PFD ISO standard development.

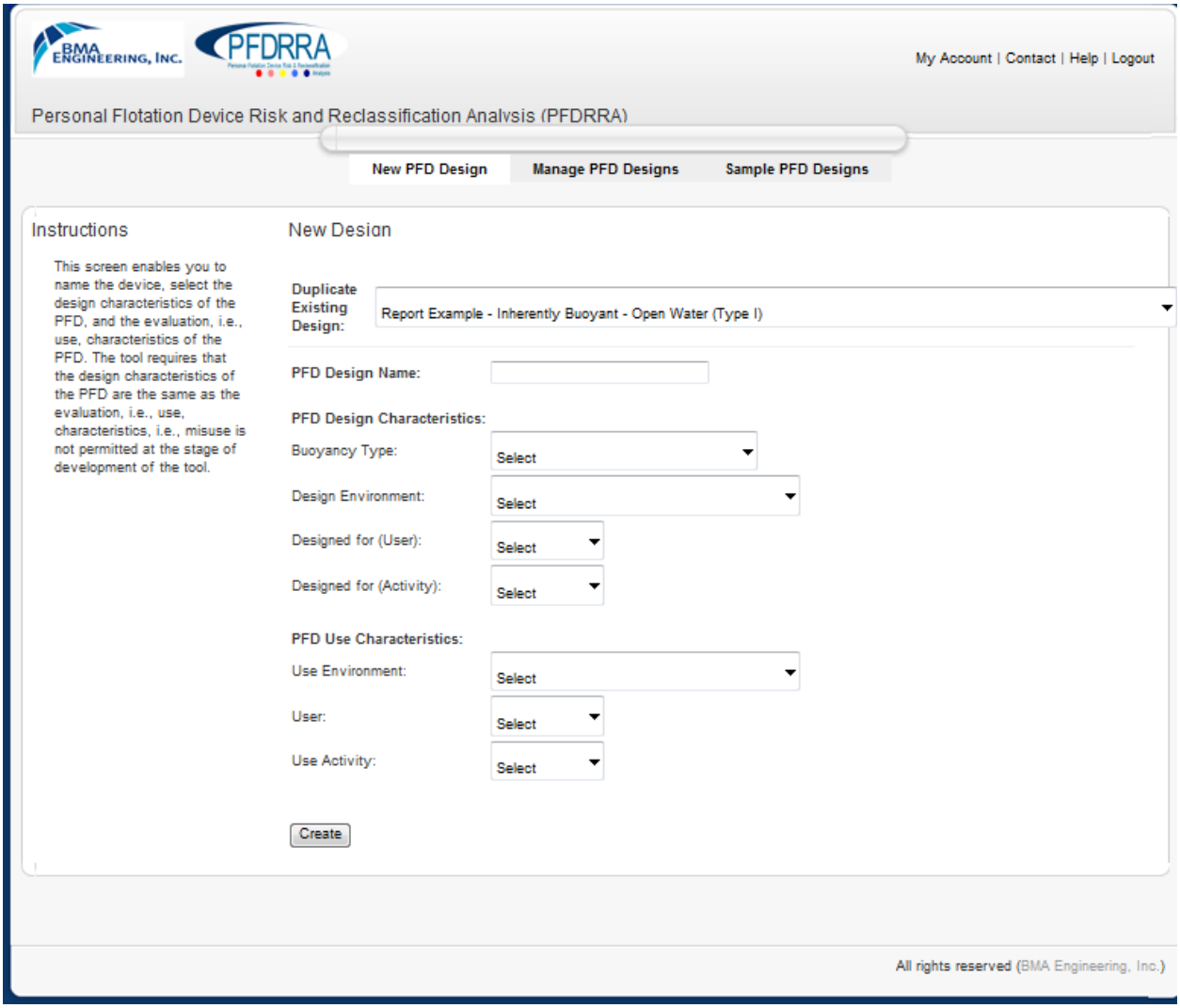
Document No. 3 – "ISO NA_Part9annexF_PFDRRA_2010-04-10_f"

The technical basis document for consideration into the ISO 12402 Personal Flotation Device Standards was further updated based upon the activities under Phase IV. This document consists of the Aggregate in-Water Effectiveness of PFDs using Risk and Reclassification Analysis (PFDRRA) Models. It is under consideration as an Annex F to Part 9 of the ISO 12402 Standards. Part 9 specifies the Test Methods to be used for meeting the compliance requirements of Parts 1 – 6 of ISO 12402.

Phase V (USCG 1002.31) Finalizing the Draft Standard and Web Tools on Wearable PFDs

The overall objective of this phase was to finalize the draft standard on the use of Risk-Based Assessment for wearable PFDs as well to enhance the PFDRRA web tool and associated tools. The task group (TG) that was established by the Standards Technical Panel of the UL will prepare the draft standard to offer provisions on minimum component and device performance requirements and a minimum aggregate for the device performance for the compliance determination to the standard to enable risk-informed tradeoffs where appropriate.

The deliverable for this Phase is the attached reference document entitled ISO_PFDRRATechReport2011-01-01docx". The revised version of the PFDRRA web tool is accessible to the USCG (Brandi Baldwin and Martin Jackson) as well as other involved parties. Please refer to Pages 3-5 of this document for screen captures of the PFDRRA web tool. Additional access is available by contacting BMA Engineering, "ayyub@bmaengineering.com".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PFDRRA
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Personal Flotation Device Risk and Reclassification Analysis (PFDRRA)
New PFD Design
Manage PFD Designs
Sample PFD Designs
Instructions
This screen enables you to name the device, select the design characteristics of the PFD, and the evaluation, i.e., use, characteristics of the PFD. The tool requires that the design characteristics of the PFD are the same as the evaluation, i.e., use, characteristics, i.e., misuse is not permitted at the stage of development of the tool.
New Design
Duplicate Existing Design:
Report Example - Inherently Buoyant - Open Water (Type I)
PFD Design Name:
PFD Design Characteristics:
Buoyancy Type:
Select
Design Environment:
Select
Designed for (User):
Select
Designed for (Activity):
Select
PFD Use Characteristics:
Use Environment:
Select
User:
Select
Use Activity:
Select
Create
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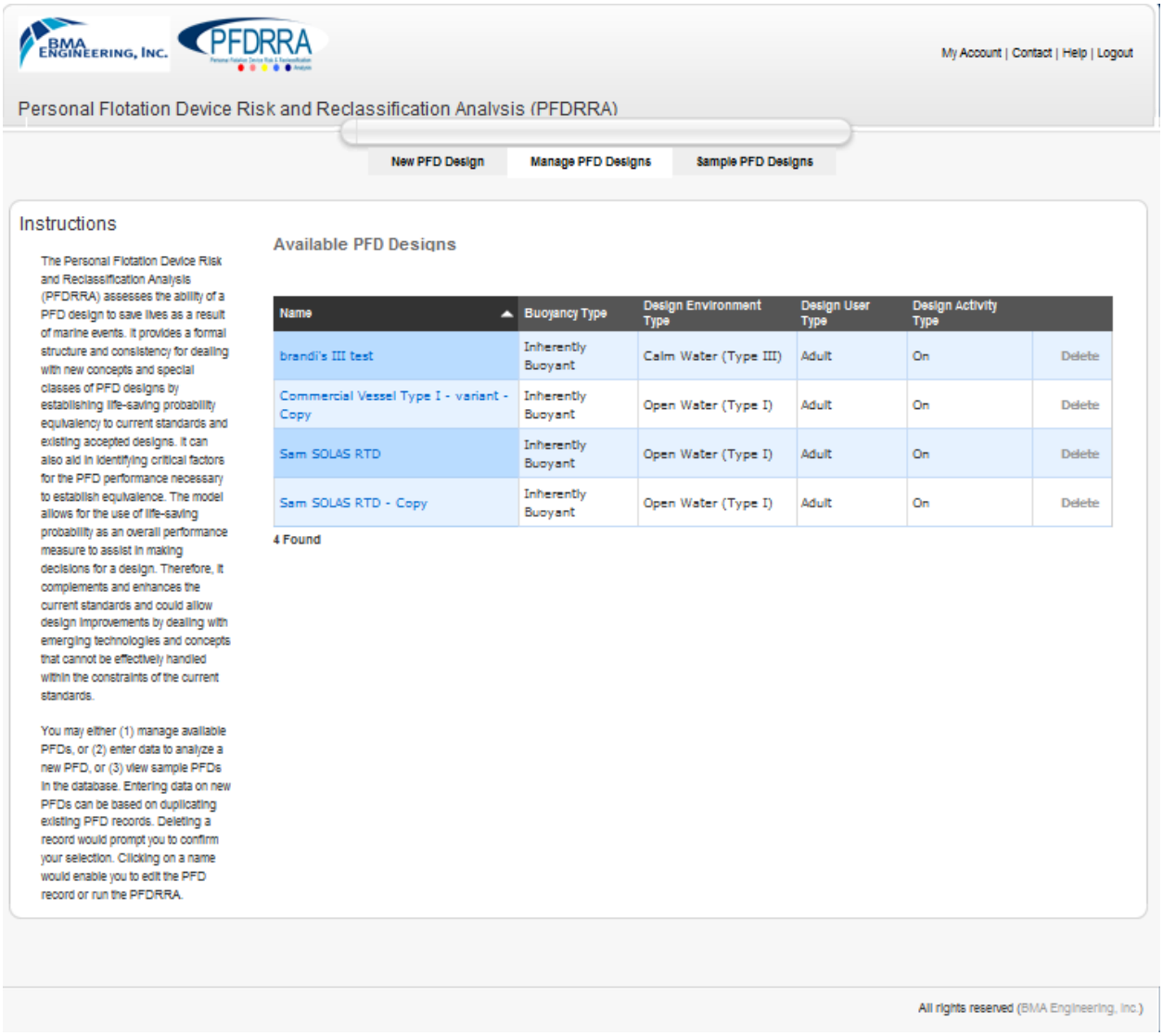
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Personal Flotation Device Risk and Reclassification Analysis (PFDRRA)
New PFD Design
Manage PFD Designs
Sample PFD Designs
Instructions
The Personal Flotation Device Risk and Reclassification Analysis (PFDRRA) assesses the ability of a PFD design to save lives as a result of marine events. It provides a formal structure and consistency for dealing with new concepts and special classes of PFD designs by establishing life-saving probability equivalency to current standards and existing accepted designs. It can also aid in identifying critical factors for the PFD performance necessary to establish equivalence. The model allows for the use of life-saving probability as an overall performance measure to assist in making decisions for a design. Therefore, it complements and enhances the current standards and could allow design improvements by dealing with emerging technologies and concepts that cannot be effectively handled within the constraints of the current standards.
You may either (1) manage available PFDs, or (2) enter data to analyze a new PFD, or (3) view sample PFDs in the database. Entering data on new PFDs can be based on duplicating existing PFD records. Deleting a record would prompt you to confirm your selection. Clicking on a name would enable you to edit the PFD record or run the PFDRRA.
Available PFD Designs
Name
Buoyancy Type
Design Environment Type
Design User Type
Design Activity Type
brandi's III test
Inherently Buoyant
Calm Water (Type III)
Adult
On
Delete
Commercial Vessel Type I - variant - Copy
Inherently Buoyant
Open Water (Type I)
Adult
On
Delete
Sam SOLAS RTD
Inherently Buoyant
Open Water (Type I)
Adult
On
Delete
Sam SOLAS RTD - Copy
Inherently Buoyant
Open Water (Type I)
Adult
On
Delete
4 Found
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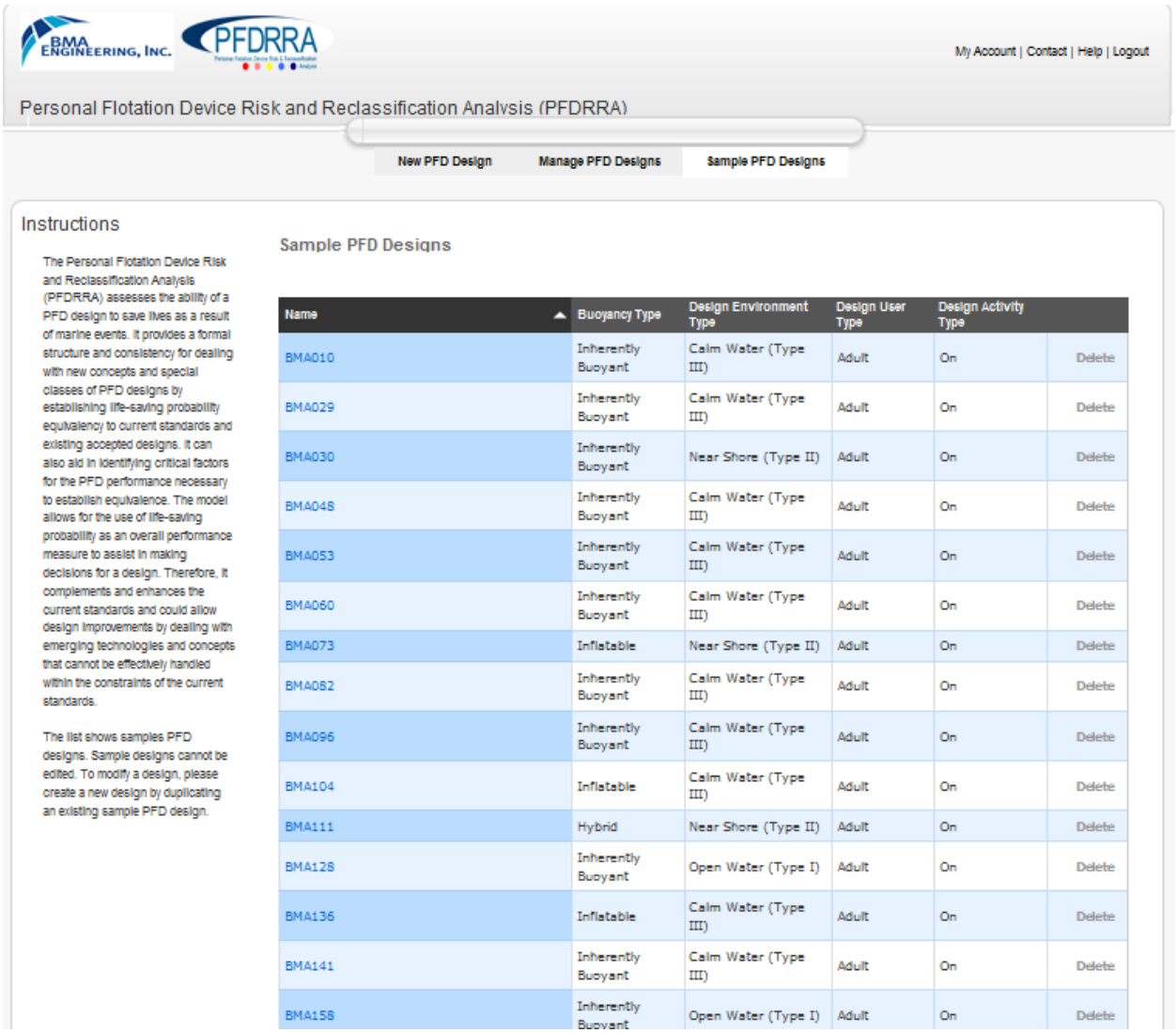
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The list shows samples PFD designs. Sample designs cannot be edited. To modify a design, please create a new design by duplicating an existing sample PFD design.
Sample PFD Designs
Name
Buoyancy Type
Design Environment Type
Design User Type
Design Activity Type
BMA010 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA029 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA030 Inherently Buoyant Near Shore (Type II) Adult On Delete
BMA048 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA053 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA060 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA073 Inflatable Near Shore (Type II) Adult On Delete
BMA082 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA096 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA104 Inflatable Calm Water (Type III) Adult On Delete
BMA111 Hybrid Near Shore (Type II) Adult On Delete
BMA128 Inherently Buoyant Open Water (Type I) Adult On Delete
BMA136 Inflatable Calm Water (Type III) Adult On Delete
BMA141 Inherently Buoyant Calm Water (Type III) Adult On Delete
BMA158 Inherently Buoyant Open Water (Type I) Adult On Delete