US 20140165900A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2014/0165900 A1**

(43) **Pub. Date: Jun. 19, 2014**

Ceeney et al.

(54) **MARINE EVACUATION SYSTEMS AND METHODS**

(71) Applicants: **Paul Ceeney**, Katy, TX (US); **Gary Ceeney**, Fulshear, TX (US)

(72) Inventors: **Paul Ceeney**, Katy, TX (US); **Gary Ceeney**, Fulshear, TX (US)

(21) Appl. No.: **13/694,620**

(22) Filed: **Dec. 17, 2012**

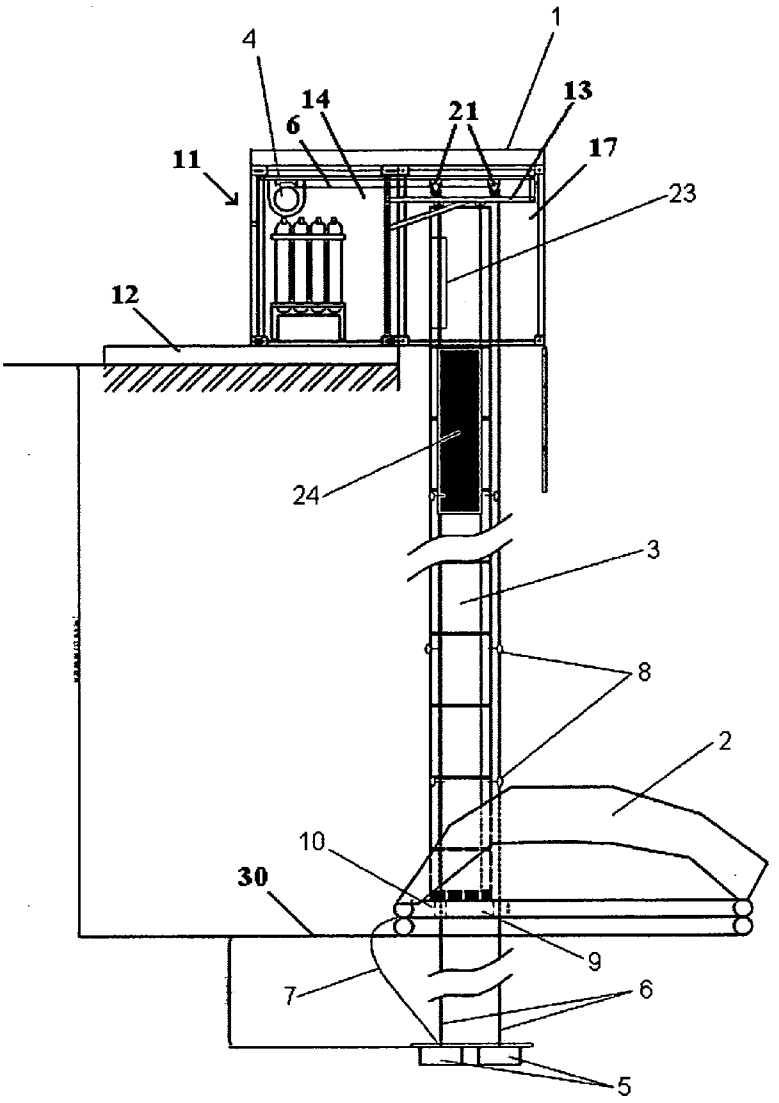
Publication Classification

(51) **Int. Cl.**
B63B 23/48 (2006.01)

(52) **U.S. Cl.**
CPC ***B63B 23/48*** (2013.01)
USPC **114/366**

(57) **ABSTRACT**

A marine evacuation system includes an escape vessel, a platform removably engaged with the vessel, and a conduit. The conduit can enable direct passage of personnel from the facility to be evacuated to the escape vessel, while the platform and conduit can be configured to engage a stabilization system while permitting vertical movement of the platform and escape vessel caused by wave motion. The platform can optionally include movable portions that allow rotation or other horizontal movement of the escape vessel relative to the platform, such as movement caused by severe weather. The system can be stored within a container or skid, with a winch or similar mechanism for deploying and retrieving the system. The container or skid and the chute can be adapted to protect personnel from fire, heat, smoke, explosion, and other hazards.



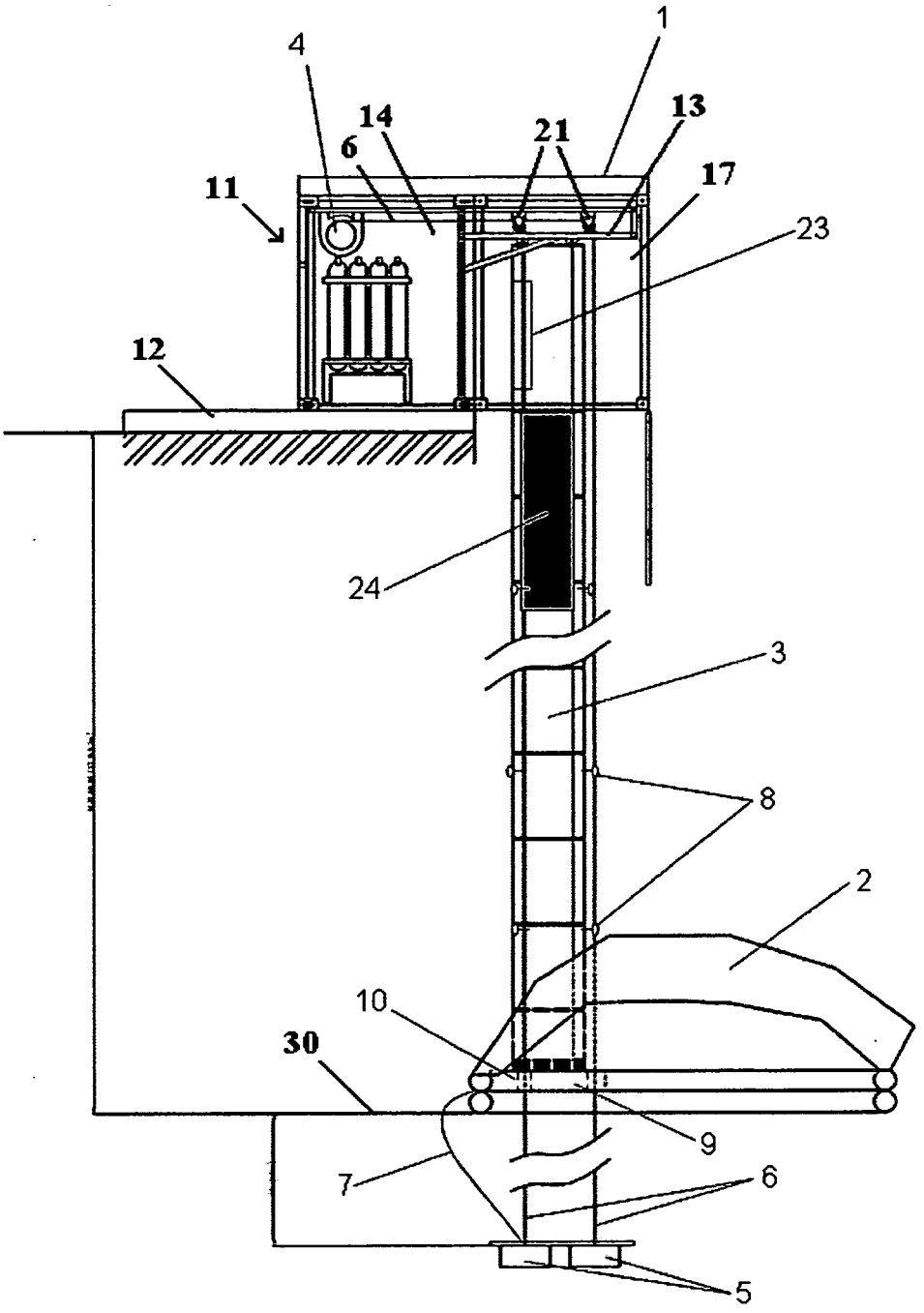


Figure 1

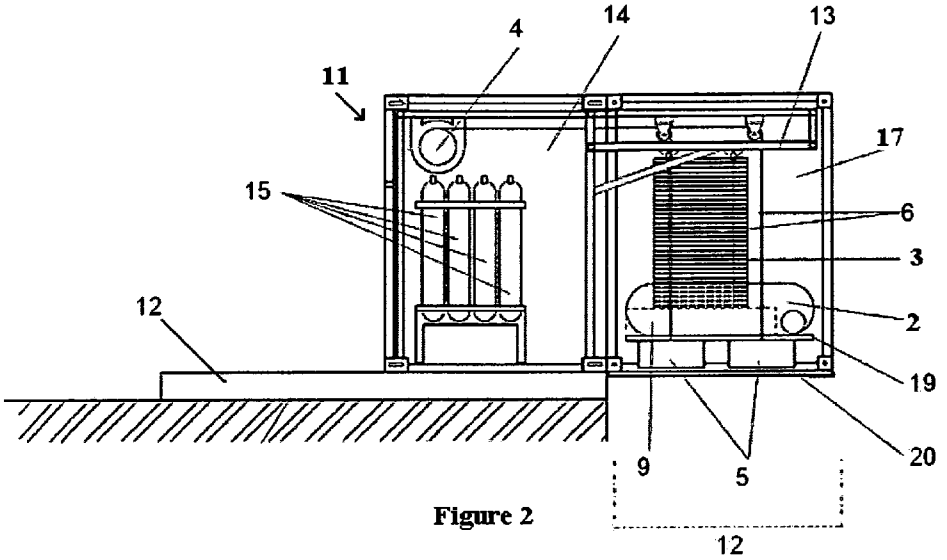


Figure 2

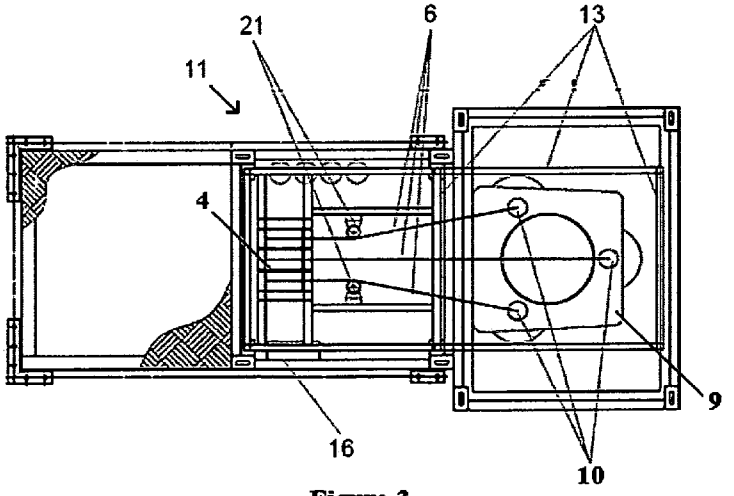


Figure 3

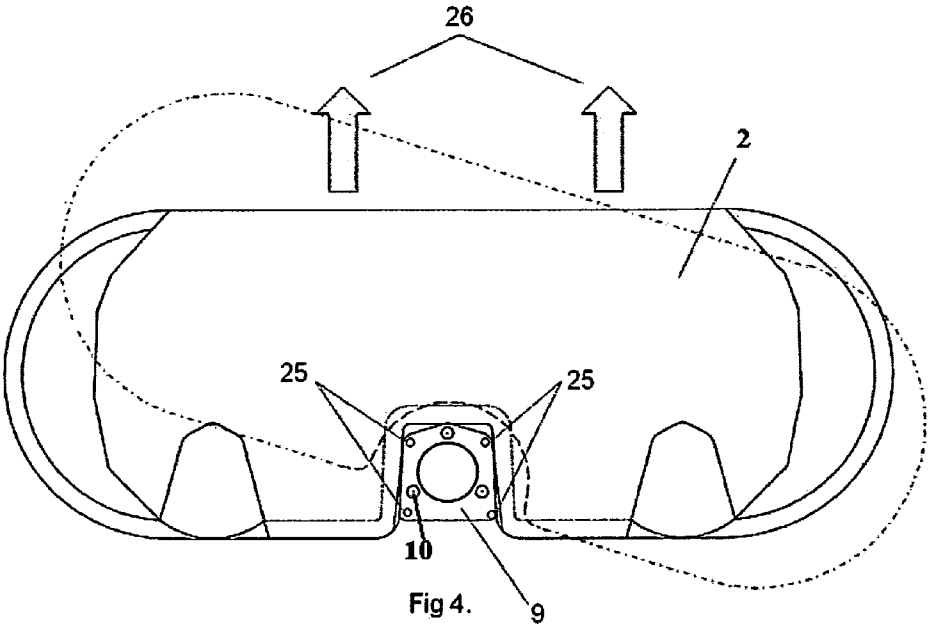


Fig 4.

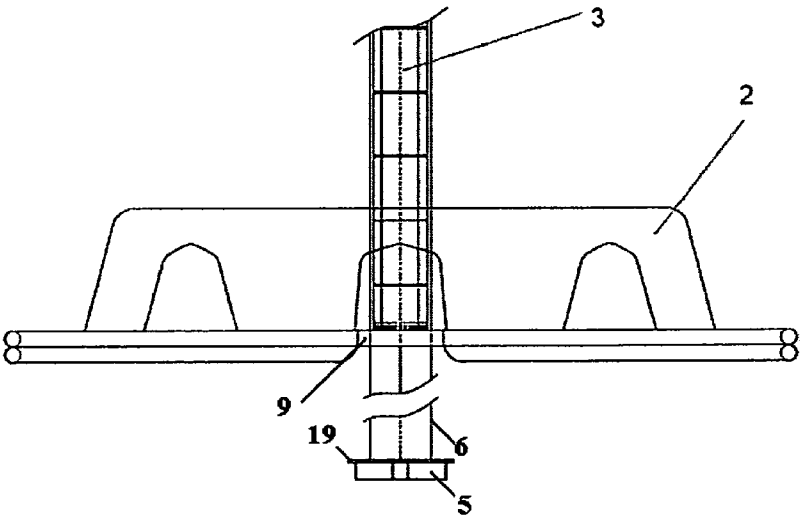


Fig 5.

MARINE EVACUATION SYSTEMS AND METHODS

FIELD

[0001] Embodiments usable within the scope of the present disclosure relate, generally, to marine evacuation systems usable to launch escape vessels from facilities, such as fixed or mobile offshore oil and gas facilities, and more specifically, to modular systems and methods for launching escape vessels that can include an escape vessel, escape chute, and breakaway landing platform stowed in a skid or similar container at a facility and deployable to sea level, such as through use of an internal pneumatically operated winch.

BACKGROUND

[0002] Evacuation during an emergent situation from an offshore vessel or facility, such as an oil and gas platform, is primarily accomplished using davit or freefall lifeboats, which are mandated by international (e.g., IMO SOLAS) and various national laws. Enough space for 200% of the personnel on a facility or vessel must be accommodated by at least two life boats located in a protected area of the facility; however, to enable evacuation of personnel that are unable to access the lifeboats in an emergent situation (e.g., fire, explosion, etc.), an alternative "secondary" means of evacuation is also typically provided. The primarily alternative means of evacuation in use includes throw-over, self-righting life rafts, mounted at all deck levels around a facility. After deployment over the side of a deck, such a life raft free falls to sea level, where it can then be inflated from deck level by pulling on a painter line; however, after deploying and inflating the life raft, personnel must then find means of moving from the deck to sea level, which typically includes a knotted rope or rope ladder. Due to the fact that the decks of most offshore oil and gas facilities are at a significantly higher elevation than that of most ship decks (80-120 feet), maneuvering from deck level to sea level is hazardous and readily results in injuries and facilities.

[0003] To improve this situation and reduce risk, proposals have been made to use a davit to lower an inflated life raft to sea level; however, this undertaking requires personnel to ride the life raft from deck level to sea level. Other methods include use of an open-mesh stocking connecting a deck-mounted frame or container to an open-boarding raft at sea level. Individuals can descend through the stocking, generally unprotected from the elements, fire, etc., to reach a large-diameter boarding raft that is open to the elements, from which they must cross-board to one of multiple closed-canopy life rafts, which must be pulled into and tied off to the boarding raft. Therefore, many risks remain with this solution. For example, use of an open mesh stocking provides no protection to personnel from smoke, direct flame envelopment, or high heat flux, which are common phenomenon in such situations that require evacuation, and all of which can incapacitate an evacuee and block the route from the deck to the boarding raft. Further, the open boarding raft provides no protection from waves or weather, which creates the potential for individuals to be washed overboard, slip and fall into the sea, or fall between the boarding raft and life raft during the cross-boarding process. Additionally, pulling life rafts to the boarding raft is a hazardous process, especially during moderate to severe weather conditions, as the rafts are heavy and difficult to recover and tie off. Also, by evacuating personnel into multiple life rafts the personnel are dispersed and therefore more difficult to recover following and emergent situation.

[0004] A need exists for systems that are both deployable and boardable, from the deck of a facility, and that can be boarded directly by a user without requiring cross-boarding or similar hazardous undertakings.

[0005] A need also exists for systems that protect personnel from emergent conditions, such as flames, heat, and smoke, during the evacuation process.

[0006] Embodiments usable within the scope of the present disclosure meet these needs.

SUMMARY

[0007] Embodiments usable within the scope of the present disclosure relate, generally, to an evacuation system for launching an escape vessel (e.g., a single, high-capacity, inflatable life raft) from an offshore facility (e.g., a fixed or mobile oil and gas production, accommodation, and/or drilling facility), that can be deployed from the deck of a facility to sea level (e.g., from within a skid-mounted storage container, deployable via a pneumatic winch or similar mechanism, which can be within the container). In an embodiment, a life raft can be deployed to sea level, the life raft being engaged with a buoyant breakaway landing platform, while an escape chute extends from the deck of the facility or ship being evacuated to the breakaway platform.

[0008] Once the life raft reaches sea level, it can be inflated, e.g., using a painter line thereof, which in an embodiment, can be connected to a tensioner can or similar stabilization member deployed beneath the water. As the life raft inflates, it can be deployed around the breakaway platform. Once the escape chute is fully extended, personnel can enter the chute (e.g., from the deck of the facility or ship being evacuated), and pass down the chute to directly enter the life raft via the platform. An embodiment can include use of an escape chute that is generally enclosed (e.g., formed from a close knit Kevlar material, with structural stainless steel hoops connected at each cell by high tensile strength Kevlar cables), and that is protected from fire, heat, and/or smoke (e.g., through use of a protective outer sheath.) The breakaway landing panel can be configured in a fixed orientation with regard to the life raft or configured with a hoop bearing assembly or similar bearing/roller configuration that enables the life raft to move rotationally relative to the platform, such as when influenced by wind or current. Embodiments can also include an associated stabilization system for the escape chute, that extends through the landing platform. For example, while an escape chute can terminate at a life raft, cables and/or associated portions of a stabilizing system can extend through the platform to below the sea level, such that the platform and/or raft can move vertically responsive to waves and/or current due to the ability of the platform to move vertically relative to the stabilization cables.

[0009] After boarding, the breakaway platform can be detached from the life raft, such as through disengagement of quick disconnect pins and/or clamps, enabling the raft to float free of the escape chute and away from a hazard. The escape chute and/or platform can then be recovered for reuse, such as through use of a winch or similar mechanism.

[0010] Thus, embodiments usable within the scope of the present disclosure can include use of a telescoping, close-knit escape chute that is protects evacuating personnel from fire, smoke, and/or gas, that can extend from a deck of a facility

(e.g., a container secured on the deck) directly to an escape vessel, allowing individuals to board a life raft or similar vessel directly without requiring cross-boarding on an open platform. Use of such a system can also enable use of a single, high-capacity escape vessel, which can enable recovery of personnel by emergency responders much more efficiently, as all personnel can be recovered at a single location. Embodiments usable within the scope of the present disclosure can further include a telescoping, close-knit, fire, smoke, and gas-protected escape conduit, securable between a deck of a facility and an escape vessel, useable to protect personnel from emergent conditions, while also reducing the possibility of becoming snagged, stuck, and/or caught on conventional, open-mesh stocking.

BRIEF DESCRIPTION OF DRAWINGS

[0011] The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate an implementation of apparatus consistent with the present invention and, together with the detailed description, serve to explain advantages and principles consistent with the invention.

[0012] FIG. **1** depicts a diagrammatic side view of an embodiment of a system usable within the scope of the present disclosure, the system being in a deployed position for enabling passage from a facility to an escape vessel.

[0013] FIG. **2** depicts a diagrammatic side view of the system of FIG. **1** in a stowed position.

[0014] FIG. **3** depicts a diagrammatic top view of the system of FIG. **2**.

[0015] FIG. **4** depicts a diagrammatic top view of an embodiment of an escape vessel and landing platform, engageable with an escape chute, usable within the scope of the present disclosure.

[0016] FIG. **5** depicts a diagrammatic side view of the escape vessel, landing platform, and escape chute of FIG. **4**.

DESCRIPTION OF EMBODIMENTS

[0017] Embodiments usable within the scope of the present disclosure relate to evacuation systems and methods. A specific embodiment can include a skid or similar container/structure able to be secured to a deck or other portion of a facility (e.g., a bolt-town skid frame with an over-the-side cantilever section), and a container mounted to the skid frame having a door (e.g., a rear door) or similar access feature and optionally, hazard-resistant outer cladding. A pneumatic winch and associated cables, pulleys, accumulators, drum, and structural supports can be positioned within the skid; however, other types of mechanisms (e.g., mechanical, hydraulic, electrical) usable to deploy the evacuation system can also be used without departing from the scope of the present disclosure. In an embodiment, the container and/or skid can further include one or more lights (e.g., an internal, explosion-proof lighting system rated for hazardous area use, such as a classification Zone I Div 1 Class I light source). An escape vessel (e.g., a high-capacity, SOLAS-approved life raft) can be provided within the skid/container or within an associated skid/container (e.g., an open-grid, lightweight support frame underneath or otherwise in association with the skid containing the other system components), and a conduit (e.g., a close-knit, telescoping, vertical escape chute having an outer covering resistant to fire, smoke, and/or heat) can be provided in engagement with the escape vessel via a breakaway landing platform engaged therewith and configured for quick disconnect from the escape vessel. An embodiment of the landing platform can include a first member portion relative to a second (e.g., using a bearing/roller arrangement) to enable the escape vessel to rotate and/or otherwise move along a horizontal plane relative to the conduit and/or platform. A stabilization system (e.g., cable tensioning cans) can also be provided in association with the conduit and deployed concurrently with the remainder of the system.

[0018] With reference to FIG. **1**, an embodiment of a marine evacuation system is shown in which a container and/or skid frame (**11**) is positioned on the deck (**12**) of a facility such that a forward portion/compartment (**17**) of the container and/or skid frame (**11**) extends outward from the deck (**12**) (e.g., overhanging therefrom) above a body of water (**30**). The container and/or skid frame can be bolted to the deck (**12**) and/or any intermediate support structure. In an embodiment a skid frame can be attached to and/or otherwise provided into association with the deck (**12**) and a container housing the evacuation system can be bolted to and/or otherwise secured to the skid frame. The container and/or skid frame (**11**) can be designed to protect the contents and any personnel within from smoke, fire, heat, and/or explosion.

[0019] A rear portion/compartment (**14**) of the container and/or skid frame (**11**) is shown having a pneumatic winch (**4**) contained therein, with associated accumulator bottles (**15**), while cables and/or wires (**6**) associated therewith extend from the rear portion/compartment (**14**) to the overhanging portion of the container and/or skid frame to engage pulleys (**21**), such that the winch (**4**) is usable to deploy a telescoping escape chute (**3**) from the level of the deck (**12**) to the level of the body of water (**30**) below. An embodiment can include an electrical junction box (**16**, shown in FIG. **3**) or similar components, for use providing power to one or more light sources within the container and/or skid frame (**11**) (e.g., explosion-proof fluorescent light units, one within each compartment of the container). External connections from the facility can be provided to the system to supply pneumatic air (e.g., 80-120 psi), electrical power (120V A/C), and/or other sources of power and/or motive force, as desired. Pneumatic and/or electrical terminations can be provided in the skid frame and/or container (**11**), and electrical components can be rated for hazardous area use (e.g., Zone I, Class I, DIV I).

[0020] FIG. **1** depicts the system in a deployed position, the escape chute (**3**) extending from the level of the deck (**12**) to the body of water (**30**), terminating at a breakaway landing platform (**9**) engaged with a high capacity life raft (**2**) (e.g., using one or more pins, clamps, etc. adapted for quick removal/disconnection). The stabilization cables and/or wires (**6**) are shown extending through orifices (**10**) in the landing platform (**9**) to engage stabilization members (**5**), shown as tensioner cans, beneath the surface of the water (**30**). The stabilization members (**5**) are thereby usable to stabilize the chute (**3**), while vertical movement of the platform (**9**) and/or raft (**2**), such as motion caused by waves, is permitted due to the relative movement permitted between the platform (**9**) and cables (**6**). A painter line (**7**) of the raft (**2**) is shown attached to one of the stabilization members (**5**), such that deployment of the stabilization members (**5**) can cause inflation of the raft (**2**) during and/or after extension of the chute (**3**). The depicted escape chute (**3**) is shown having an aperture (**23**) near the upper end thereof, within the overhanging portion of the container and/or skid frame (**11**), an external fire proof chute layer (**24**) extending along at least a portion

thereof for protecting personnel from flames, heat, and/or smoke during evacuation, and structural stainless steel hoops (**8**) that connect portions of the chute (**3**) to one another.

[0021] FIGS. **2** and **3** depict side and top views, respectively, of the system of FIG. **1** in a stowed position, in which the escape chute (**3**), life raft (**2**), and platform (**9**) are retracted into the container and/or skid frame (**11**) for storage and protection thereof. Specifically, the life raft (**2**) is shown folded and/or otherwise positioned around the retracted/stowed chute column, supported by a lightweight grating (**19**). The escape chute (**3**) is anchored at its upper end to a support frame (**13**), and at its lower end to the breakaway landing platform (**9**). The stabilization members (**5**) are shown underneath the grating (**19**), the grating (**19**) being deployable therewith and/or retainable with the life raft (**2**). The lower portion of the forward compartment (**17**) is closed to the environment using a trap door (**20**) within the bottom thereof.

[0022] In use, the winch (**4**) can be used, in conjunction with the accumulators (**15**), to lower the platform (**9**) and raft (**2**) to the body of water (**30**) while extending the chute (**3**) to the position shown in FIG. **1**. Continued operation of the winch can lower the stabilization members (**5**) and grating (**19**) beneath the water (**30**), providing stability to the chute (**3**) while actuating the painter line (**7**, shown in FIG. **1**) to inflate the raft (**2**). Use of a pneumatic winch enables operation thereof without requiring external power, though it should be understood that other mechanisms could also be used to deploy the system without departing from the scope of the present disclosure. FIG. **3** shows three cables and/or wires (**6**) extending from the winch (**4**) and passing through three orifices (**10**) formed within the landing platform (**9**).

[0023] FIGS. **4** and **5** depict top and side views, respectively, of the life raft (**2**) engaged with the landing platform (**9**) and escape chute (**3**). As described above, cables (**6**) used to stabilize the chute (**3**) extend through orifices (**10**) in the platform (**9**) to engage stabilization members (**5**), thereby allowing vertical movement of the platform (**9**) and/or raft (**2**) as the cables (**6**) pass through the orifices (**10**). Additionally, the depicted embodiment includes a landing platform (**9**) that permits horizontal and/or rotational movement of the raft (**2**). Specifically, a first portion of the landing platform (e.g., an interior portion, such as a ring or hoop) can be engaged to the chute (**3**), while a second portion (e.g., an exterior ring, hoop, or similar portion) can be engaged to the raft (**2**) and/or any intermediate connectors (e.g., webbing straps). Bearings and/or rollers between the first and second portions of the platform (**9**) can permit relative rotation therebetween, such that the life raft (**2**) is able to move relative to the platform (**9**) in a horizontal plane, such as when affected by wind, waves, current, and/or other forces: FIG. **4** depicts an exemplary position of the raft (**2**) after rotational movement relative to the platform (**9**) using a dashed line.

[0024] When evacuation of a facility is desired, the system can be deployed by lowering the chute (**3**), raft (**2**), platform (**9**), and stabilization members (**5**) to the water (**30**) using the winch (**4**), after opening the trap door (**20**) (e.g., by removal and/or manipulation of a retaining pin assembly or similar mechanism.) Once the raft (**2**) reaches the water (**30**), continued deployment of the stabilization members (**5**) beneath the water (**30**) can cause inflation of the raft (**2**) about the platform (**9**), such as through actuation of a shortened painter line (**7**) of the raft (**2**) attached to one of the stabilization members (**5**). In an embodiment, during typical use, the stabilizing members (**5**) (e.g., tensioning cans) can be positioned 10-15 feet below the surface of the water (**30**). The landing platform (**9**) can retain the chute (**3**) in place through contact between the cables (**6**) and the sides of the orifices (**10**), and optionally, through use of retaining clamps, pins, and/or other types of fasteners, while the stabilization members (**5**) tension the chute (**3**) to maintain the chute column and raft (**2**) in a stable position. The raft and/or platform can move freely up and down the cables (**6**) under the influence of wave and swell action due to the passage of the cables (**6**) through the orifices (**10**) in the platform (**9**).

[0025] After the system has been deployed, personnel can enter the chute (**3**), e.g., through the aperture (**23**), and transit directly to the life raft (**2**). The external layer (**24**) can protect personnel from fire, heat, smoke, etc. In an embodiment, the escape chute (e) can be designed with discrete compartments, each with a slide such that each person can moves through the chute column one cell at a time. On reaching the landing platform (**9**) personnel can exit the chute (**3**) directly into the raft (**2**), thus eliminating the risks posed by exiting into a large diameter open boarding raft and then moving across the boarding raft to attempt to pull and enter a separate life raft. To accommodate for wave action the chute (**3**) can be designed such that each compartment offers an opening, such that whichever compartment is at the bottom (e.g., adjacent to the raft (**2**)), an aperture is present to enable personnel to exit the chute.

[0026] Once personnel have entered the raft (**2**) the raft (**2**) can be disconnected from the platform (**9**), e.g., through removal/disengagement of pins (**25**) connecting the platform (**9**) to the raft (**2**) and/or to intermediate connectors, such as webbing straps. An embodiment can include a locking pin or similar member that retains the pins (**25**) in position until removed and/or disengaged. After disengagement from the platform (**9**), the raft (**2**) can move away from the facility, such as in the direction indicated by arrows (**26**).

[0027] In an embodiment, the landing platform (**9**), chute (**3**), grating (**19**), and/or stabilization members (**5**) can remain in place for future retrieval and/or reuse, such as through use of the winch (**4**). In an embodiment, if no pneumatic air supply is available from the facility, e.g., due to shutdown in an emergency, the accumulators can be provided with sufficient capacity to recover the system without external air.

[0028] Embodiments usable within the scope of the present disclosure can thereby enable direct boarding of personnel from a facility into an escape vessel, without requiring cross-boarding or similar hazardous undertakings, and can further protect personnel from emergent conditions, such as flames, heat, and smoke, during the evacuation process.

[0029] While certain exemplary embodiments have been described in details and shown in the accompanying drawings, it is to be understood that such embodiments are merely illustrative of and not devised without departing from the basic scope thereof, which is determined by the claims that follow.

What is claimed is:

1. A marine evacuation system comprising:

an escape vessel;

a platform removably engaged with the escape vessel; and

a conduit engaged with the platform, wherein the conduit is extendable from a retracted position adapted for storage in a facility to an extended position adapted to position the escape vessel, the platform, or combinations thereof at a location remote from the facility.

2. The system of claim **1**, further comprising a mechanism for extending the conduit, retracting the conduit, or combinations thereof.

3. The system of claim **2**, wherein the mechanism comprises a pneumatic winch.

4. The system of claim **3**, further comprising an integrated power source in communication with the pneumatic winch, wherein the integrated power source provides power to the pneumatic winch sufficient to enable retraction of the escape vessel and the platform.

5. The system of claim **1**, further comprising at least one stabilization member engaged with the conduit.

6. The system of claim **5**, further comprising at least one elongate member engaging said at least one stabilization member to the conduit.

7. The system of claim **6**, wherein the platform comprises at least one orifice formed therein, and wherein said at least one elongate member passes through said at least one orifice to enable relative vertical movement between the platform and said at least one elongate member.

8. The system of claim **5**, wherein the escape vessel comprises an inflatable vessel and a mechanism for inflating the inflatable vessel engaged with said at least one stabilization member for enabling deployment of said at least one stabilization member to actuate the mechanism to cause inflation of the inflatable vessel.

9. The system of claim **1**, further comprising a skid frame, a container, or combinations thereof adapted to contain the escape vessel, the platform, and the conduit when the conduit is in the retracted position.

10. The system of claim **9**, wherein the skid frame, the container, or combinations thereof comprises a first portion positioned on a deck of the facility and a second portion extending outward from the deck of the facility above a body of water.

11. The system of claim **10**, wherein the second portion comprises a door in a lower portion thereof for enabling extension of the conduit therethrough.

12. The system of claim **1**, wherein the platform comprises a first member engaged to the conduit and a second member engaged to the escape vessel, and wherein the second member is rotatably movable relative to the first member for enabling horizontal movement of the escape vessel relative to the platform.

13. The system of claim **1**, further comprising at least one pin engaging the escape vessel, a fastener connected to the escape vessel, or combinations thereof, to the platform, wherein said at least one pin is adapted for quick removal to enable movement of the escape vessel away from the platform, the conduit, the facility, or combinations thereof.

14. The system of claim **1**, wherein the conduit comprises a first opening in communication with the facility and a second opening in communication with the escape vessel for enabling direct transport of personnel from the facility to the escape vessel through the conduit.

15. The system of claim **1**, wherein at least a portion of the conduit comprises an external layer adapted to resist flame, heat, smoke, or combinations thereof.

16. A method for enabling evacuation of a facility, the method comprising the steps of:

providing an escape vessel, a platform, and a conduit within a container, a skid frame, or combinations thereof disposed at the facility;

providing an opening in the container, the skid frame, or combinations thereof;

extending the conduit through the opening, from the facility to a remote location, wherein the conduit engages the platform, and wherein the escape vessel is removably engaged with the platform; and

disengaging the escape vessel from the platform to enable movement of the escape vessel away from the platform, the conduit, the facility, or combinations thereof.

17. The method of claim **16**, wherein the step of extending the conduit further comprises deploying at least one stabilization member engaged with the conduit and passing at least one elongate member engaged with said at least one stabilization member through an orifice in the platform to enable relative vertical movement between the platform and said at least one elongate member.

18. The method of claim **17**, wherein the step of deploying said at least one stabilization member comprises actuating a mechanism engaged with said at least one stabilization member to cause inflation of the escape vessel.

19. The method of claim **16**, further comprising the step of rotating a first portion of the platform relative to a second portion of the platform thereby moving the escape vessel relative to the platform along a horizontal plane.

20. The method of claim **16**, further comprising the step of retrieving the conduit, the platform, or combinations thereof to the facility.

* * * * *