create power. The gate **160** may thus be operated simply to ensure that the difference in the water height between the basic **156** and the ocean is sufficient to power the generator **162**. The energy collected by the tidal power system may be used to provide electrical power and cooling capacity to the modular data center **154**. As a result, the modular data center **154** may be able to operate using energy gathered from the motion of seawater.

**[0064]** The electricity may be carried to a junction or switching box **164**. The switching box **164** may pass the electricity to the floating platform **152**. When electricity is not available from the tidal basin, such as when the water level inside and outside the tidal basin is (nearly) equal, electricity may be provided from an external source, such a continental power grid **166**. At other times, such as when the modular data center **154** is not at full usage, excess power generated from the tidal basin **156** may be delivered to the power grid **166**. Also, a portion of the power for modular data center **154** may be drawn from generator **162** and a portion from the grid **166**.

**[0065]** Electricity may be passed partway to the floating platform from the switching box via a buried cable **168**. Burying the cable **168** may inhibit damage to it from wave action or beach traffic. At a point **190** away from shore, the cable emerges into the water and is connected to the floating platform **152**, thus supplying it with electricity. In some instances, the cable **168**, or a separate cable, may be used to provide communications between the floating platform and other systems located on shore. The communications cable may include, for example, one or more optical fiber bundles, and may be connected via junction or switching box **164** (which may include both power and data switching components) to an on-shore data network. In some cases, a wireless transceiver on the floating platform may be used for such communication.

**[0066]** FIG. **2** is a side view of a floating data center system **200**. In general, the system **200** has a modular data center **202** aboard a floating platform **204**, connected to one or more motion-powered machines **206**. The modular data center **202** can be made up of computer equipment in one or more modules. The motion-powered machines **206** may provide power and cooling capacity to the modular data center **202**. As a result, the modular data centers **202** may function without connecting to external utilities.

**[0067]** A modular data center **202** of a floating data center system **200** has modules **202**A, **202**B aboard a floating platform **204**. The modules **202**A, **202**B may be in a standardized format, such as an intermodal freight container, such as those used in the transportation industry. The modules **202**A, **202**B may have computing resources such as racks of servers, telecom equipment, etc.

**[0068]** In some instances, the floating platform **204** may be a ship, such as a freight hauler, outfitted to handle the modular data center **202**. The floating platform **204** provides a structure to physically support the modular data center **202** as well as utilities such as electricity and cooling capacity. The floating data center **204** may be connected to an external power generating device such as a motion-powered machine **206**. The motion-powered machine **206** may in turn harness wave energy to provide resources such as power or cooling capacity to the modular data center **202**. The modular data center **202** may use power supplied to the floating platform **204** by the motion-powered machines **206**. The connection between the floating platform **204** and the motion-powered machine **206** may be in the form of a cable **208**, for example, when electricity is being supplied. If cooling capacity is being supplied, other appropriate connectors, such as a flexible tube may also be used.

**[0069]** Power may be supplied to the floating platform **204** using standard techniques for transferring marine power. Electricity may be generated by the motion-powered machine **206** at an appropriate voltage and passed through the cable **208** to the floating platform **204**. For example, a high-voltage AC electrical system may be used with a step-up transformer located in the motion-powered machine **206** and a step-down transformer located in the floating platform **204**.

**[0070]** The electricity may be passed through a power converter **224** and be distributed to various systems, such as a pump **216** or data center modules **202**A, **202**B. Power lines **220** within the ship **204** may distribute electricity to the modular data centers **202**A, **202**B. In some instances, the power converter **224** may output several different voltages. For example, it may output 120V AC 60 Hz for electronics designed for the North American power grid and 240V AC 50 Hz for electronics designed for European power grids. DC power may also or alternatively be provided, for example, for certain server racks that do not use switching power supplies.

**[0071]** Cool water is denser than warm water, causing water below the surface to be cooler than water at or near the surface. To take advantage of this, the cool water may be drawn through an inlet tube **210** that extends below the surface. Pump **216** may be used to draw in the cool water and send it through supply pipes **218** for distribution to the modules **202**A, **202**B. The cool water may also pass through heat exchangers (not shown) either at or away from the data center modules. Such use of heat exchangers allows the relatively caustic seawater to be isolated in only one part of the system, with fresh water or other coolant circulating in a closed-loop system on the other side of the heat exchangers. As a result, maintenance may be minimized, as the closed-loop side of the system may be kept in operation, with frequent replacements needed only on the saltwater side of the system.

**[0072]** The heat exchangers may be connected to integrated cooling systems within the modules **202**A, **202**B that directly cool equipment. The cool water warms up as it absorbs waste heat deposited in the heat exchangers, for instance, by computer equipment. The warm water may pass through return pipes **220** and be expelled, for example, through a port **214** in the rear of the floating platform **204**.

**[0073]** The floating platform **204** may have integrated control systems for handling power and cooling. For example, the floating platform **204** may have power monitoring equipment that automatically brings on additional sources of power, such as other motion-powered machines or backup generators, as the load demanded by the modular data center **202** increases. An automatic control system, which may be housed with power converter **224** and may be controlled from the deck of the floating platform **204** or other appropriate area (such as by distributed controls in each of the modules **202**A, **202**B), may be used to adjust cooling capacity to an optimum level that provides sufficient cooling without excessive wear and tear on moving parts. For example, in some implementations, temperature sensors integrated with the supply **218** and return **220** pipes may be used to determine whether the current flow rate is sufficient to keep the modular data center cool. In some implementations, the modules **202**A, **202**B may have sensing and control systems that are integrated with the floating platform **204** such that they request additional cooling capacity when needed.