WHAT IS CLAIMED

1. A method for dehydrating crude oil on a floating production storage and offloading installation, the method comprising:

routing an incoming produced water stream containing approximately 20 to 80 percent water and 80 to 20 percent oil to a separator vessel;

routing an outlet stream from the separator vessel to a flash vessel;

routing an outlet stream from the flash vessel to a treatment block, wherein the treatment block consists of a low pressure degasser and a compact electrostatic separator pre-treater;

routing an outlet stream from the treatment block to a cargo tank, wherein the outlet stream from the treatment block comprises approximately 3 to 10 percent water-in-oil and an outlet stream from the cargo tank comprises approximately 1 percent water-in-oil; and

routing the outlet stream from the cargo tank to an electrostatic treater, which produces a final outlet stream containing no more than approximately 0.5 percent BS&W.

2. A method according to claim 1, wherein the separator vessel is a two-phase separator/degasser, the two-phase separator/degasser including an inlet cyclonic distributor and demisting cyclones.

3. A method according to claim 1, wherein the separator vessel is two, two-phase separator/degassers that operate in parallel, with each separator/degasser receiving approximately 50 percent of the incoming produced water stream.

4. A method according to claim 1, wherein the low pressure degasser receives the outlet stream of the flash vessel and the compact electrostatic separator pre-treater receives an outlet stream of the low pressure degasser.

5. A method according to claim 1, wherein the compact electrostatic separator pre-treater receives the outlet stream of the flash vessel and the low pressure degasser receives an outlet stream of the compact electrostatic separator pre-treater.

6. A method for dehydrating crude oil on a floating production storage and offloading installation, the method comprising

routing an incoming produced water stream containing approximately 20 to 80 percent water and 80 to 20 percent oil to a separator vessel;

routing an outlet stream from the separator vessel to a flash vessel;

routing an outlet stream from the flash vessel to a treatment block, the treatment block comprising a low pressure degasser and a compact electrostatic separator pre-treater;

routing an outlet stream from the treatment block to a cargo tank, wherein the outlet stream from the treatment block comprises approximately 3 to 10 percent water-in-oil and an outlet stream from the cargo tank comprises approximately 1 percent water-in-oil; and

routing the outlet stream from the cargo tank to an electrostatic treater, which produces a final outlet stream containing no more than approximately 0.5 percent BS&W.

7. A method according to claim 6, wherein the separator vessel is a two-phase separator/degasser, the two-phase separator/degasser including an inlet cyclonic distributor and demisting cyclones.

8. A method according to claim 6, wherein the separator vessel is two, two-phase separator/degassers that operate in parallel, each two-phase separator/degasser receiving a portion of the incoming produced water stream.

9. A method according to claim 6, wherein the low pressure degasser receives the outlet stream of the flash vessel and the compact electrostatic separator pre-treater receives an outlet stream of the low pressure degasser.

10. A method according to claim 6, wherein the compact electrostatic separator pre-treater receives the outlet stream of the flash vessel and the low pressure degasser receives an outlet stream of the compact electrostatic separator pre-treater.

11. A method according to claim 6, wherein the final outlet stream contains a salt content no greater than approximately 285 mg per liter.

12. A method according to claim 6, wherein the compact electrostatic separator pre-treater comprises two elongated separator vessels that are oriented at an incline and connected to each other.