4. The fusion reactor of Claim 1, wherein at least one of the one or more heat injectors is not aligned with the centerline of the enclosure.

5. The fusion reactor of Claim 4, wherein the at least one of the one or more heat injectors not aligned with the centerline is operable to inject an elliptical-shaped beam of neutral particles into the enclosure.

6. The fusion reactor of Claim 1, wherein the one or more heat injectors are operable to focus the beam of neutral particles toward a focal point within the enclosure.

7. The fusion reactor of Claim 1, wherein the one or more heat injectors are operable to cause the beam of neutral particles to diverge as it propagates in the enclosure.

8. The fusion reactor of Claim 1, wherein the direction of current in the center magnetic coil, the plurality of encapsulating magnetic coils, and the two mirror magnetic coils is the same and wherein the direction of current in the two internal magnetic coils is opposite the direction of current in center magnetic coil, the plurality of encapsulating magnetic coils, and the two mirror magnetic coils.

9. The fusion rector of Claim 1, wherein the two internal magnetic coils are surrounded by, and shielded from, the plasma and suspended within the enclosure by at least one support.

~~8~~10. A fusion reactor comprising:

two internal magnetic coils suspended within an enclosure;

a center magnetic coil coaxial with the two internal magnetic coils and located proximate to a midpoint of the enclosure;

a plurality of encapsulating magnetic coils coaxial with the internal magnetic coils, the encapsulating magnetic coils being operable to preserve the magnetohydrodynamic (MHD) stability of the fusion reactor by maintaining a magnetic wall that prevents plasma within the enclosure from expanding;

two mirror magnetic coil coaxial with the internal magnetic coils; and

one or more heat injectors operable to inject a beam of neutral particles toward the center of the enclosure.

~~9~~11. The fusion reactor of Claim ~~8~~10, wherein at least one of the one or more heat injectors is aligned with a centerline of the enclosure.

~~10~~12. The fusion reactor of Claim ~~9~~11, wherein the at least one of the one or more heat injectors aligned with the centerline is operable to inject a circular-shaped beam of neutral particles into the enclosure.

~~11~~13. The fusion reactor of Claim ~~8~~10, wherein at least one of the one or more heat injectors is not aligned with a centerline of the enclosure.

~~12~~14. The fusion reactor of Claim ~~11~~13, wherein the at least one of the one or more heat injectors not aligned with the centerline is operable to inject an elliptical-shaped beam of neutral particles into the enclosure.

~~13~~15. The fusion reactor of Claim ~~8~~10, wherein the one or more heat injectors are operable to focus the beam of neutral particles toward a focal point within the enclosure.

~~14~~16. The fusion reactor of Claim ~~8~~10, wherein the one or more heat injectors are operable to cause the beam of neutral particles to diverge as it propagates in the enclosure.

17. The fusion reactor of claim 10, wherein the two mirror magnetic coils comprise first and second mirror magnetic coils disposed on opposite sides of the center magnetic coil.

18. The fusion reactor of Claim 10, wherein the direction of current in the center magnetic coil, the plurality of encapsulating magnetic coils, and the two mirror magnetic coils is the same and wherein the direction of current in the two internal magnetic coils is opposite the direction of current in center magnetic coil, the plurality of encapsulating magnetic coils, and the two mirror magnetic coils.

19. The fusion rector of Claim 10, wherein the two internal magnetic coils are surrounded by, and shielded from, the plasma and suspended within the enclosure by at least one support.

~~15~~20. A method comprising:

energizing two internal magnetic coils suspended within an enclosure;

energizing a center magnetic coil coaxial with the two internal magnetic coils and located proximate to a midpoint of the enclosure;

energizing a plurality of encapsulating magnetic coils coaxial with the internal magnetic coils, the encapsulating magnetic coils being operable, when energized, to preserve the magnetohydrodynamic (MHD) stability of the fusion reactor by maintaining a magnetic wall that prevents plasma within the enclosure from expanding;

energizing two mirror magnetic coil coaxial with the internal magnetic coils; and

injecting a beam of neutral particles toward the center of the enclosure.

~~16~~21. The method of Claim ~~15~~20, wherein the beam of neutral particles are operable to fuel fusion reactions.

~~17~~22. The method of Claim ~~15~~20, wherein the beam of neutral particles are selected to form fully ionized plasma in the enclosure.

~~18~~23. The method of Claim ~~15~~20, wherein the beam of neutral particles comprises ions.

~~19~~24. The method of Claim ~~15~~20, wherein the beam of neutral particles comprises deuterium particles.

~~20~~25. The method of Claim ~~19~~24, wherein the deuterium particles are selected to form deuterium gas in the enclosure.

26. The method of Claim 20, wherein the direction of current in the center magnetic coil, the plurality of encapsulating magnetic coils, and the two mirror magnetic coils is the same and wherein the direction of current in the two internal magnetic coils is opposite the direction of current in center magnetic coil, the plurality of encapsulating magnetic coils, and the two mirror magnetic coils.

27. The method of Claim 20, wherein the two internal magnetic coils are surrounded by, and shielded from, the plasma and suspended within the enclosure by at least one support.