What is claimed:

1. A laser riser and blowout preventer system for use with an offshore drilling rig, a vessel or a platform to control and manage potential emergency and emergency situations, the laser riser blowout preventer system comprising:
    a. a high power laser;
    b. a high power beam switch that is optically associated with the high power laser;
    c. a riser;
    d. a blowout preventer;
    e. a first laser cutter and a second laser cutter, in optical association with the high power beam switch;
    f. wherein the first laser cutter is positioned adjacent the riser, whereby the first laser cutter is capable of directing a first high power laser beam toward a component of the riser;
    g. wherein the second laser cutter is positioned in the blowout preventer, whereby the second laser cutter is capable of directing a second high power laser beam toward a tubular within the blowout preventer; and,
    h. a control network in data and control communication with the laser, the beam switch and the blowout preventer, wherein the control network provides for firing of the laser and actuation of the blowout preventer.
2. The system of claim 1, wherein the control network comprises a memory device comprising a series of instructions for executing a predetermined sequence of firing the first laser cutter and the second laser cutter and actuation of the blowout preventer.
3. The system of claim 1, wherein the high power laser has at least about 10 kW of power.

4. The system of claim 1, wherein the high power laser has at least about 20 kW of power.

5. The system of claim 1, wherein the high power laser has at least about 40 kW of power.

6. The system of claim 1, comprising a second high power laser.

7. The system of claim 6, wherein only one of high power laser and the second high power laser is on line at any given time.

8. A laser riser and blowout preventer system to control and manage potential emergency and emergency situations, the laser riser blowout preventer system comprising:

   a. a first high power laser and a second high power laser;

   b. a riser;

   c. a blowout preventer;

   d. a first laser cutter and a second laser cutter, the first laser cutter being in optical association with the first high power laser and the second optical cutter being in optical association with the second high power laser; and,

   e. wherein the first laser cutter is associated with the riser and, wherein the second laser cutter is associated with the blowout preventer.

9. The system of claim 8, comprising a third laser cutter, wherein one of the second or third laser cutters is associated with an upper portion of the blowout preventer and another one of the second or third laser cutters is associated with a lower portion of the blowout preventer.

10. The system of claim 8, wherein the first high power laser has at least about 20 kW of power.

11. The system of claim 8, wherein the first high power laser has at least about 40 kW of power.

12. A laser riser and blowout preventer system to control and manage potential emergency and emergency situations, the laser riser blowout preventer system comprising:

    a. a high power laser;

    b. a high power beam switch in optical and control association with the high power laser;

    c. a riser comprising a first laser cutter, whereby the first laser cutter is capable of directing a first high power laser beam toward a component of the riser

    d. a blowout preventer comprising a second laser cutter, whereby the second laser cutter is capable of directing a second high power laser beam toward a tubular within the blowout preventer; and,

    e. the first laser cutter and the second laser cutter are in optical association with the high power laser.

13. The system of claim 12, wherein the high power laser has at least about 10 kW of power.

14. The system of claim 12, wherein the high power laser has at least about 20 kW of power.

15. The system of claim 12, wherein the high power laser has at least about 40 kW of power.

16. The system of claim 12, comprising a second high power laser.

17. An offshore drilling rig, vessel or platform having a laser riser and blowout preventer system to control and manage potential emergency and emergency situations, the laser riser and blowout preventer system comprising:

    a. a high power laser in optical association with a high power beam switch;

b. a riser comprising a plurality of riser sections, wherein the plurality of riser sections are configured for being lowered from and operably connected to the offshore drilling rig to a depth at or near a seafloor;

c. a blowout preventer configured for being operably connected to the riser and lowered by the riser from the offshore drilling rig to the seafloor; and,

d. one of the plurality of riser sections comprising a first laser cutter for emitting a first laser beam defining a first beam path, wherein the first beam path is directed toward the one of the plurality of riser sections;

e. the blowout preventer comprising a second laser cutter for emitting a second laser beam defining a second beam path, wherein the second beam path is directed toward a cavity defined by the blowout preventer; and,

f. a control system;

g. wherein, when the riser and blowout preventer are deployed and operably associating the offshore drilling rig and a borehole in the seafloor, the control system is configured to control the firing of the first and second laser cutters.

18. The laser riser and blowout preventer system of claim 17, wherein the control system is configured to control the actuation of the blowout preventer.

19. A method of performing drilling, workover, intervention, completion or service on a subsea well by using a laser riser and blowout preventer system in conjunction with an offshore drilling rig to control and manage potential emergency and emergency situations, the method comprising:

a. lowering a blowout preventer, from an offshore drilling rig, vessel or platform to a seafloor using a riser comprising a plurality of riser sections;

b. wherein the blowout preventer comprises: a blowout preventer cavity defined by the blowout preventer; and a first laser cutter for emitting a first laser beam that defines a first beam path, wherein the first beam path is directed toward the blowout preventer cavity;

c. wherein the riser comprises: a riser cavity defined by the riser; and a second laser cutter for emitting a second laser beam that defines a second beam path, wherein the second beam path is directed toward a component of the riser;

d. operably connecting a high power laser into a control system;

e. securing the blowout preventer to a borehole, whereby the borehole cavity and the riser cavity are in fluid and mechanical communication; and,

f. performing operations on the borehole by lowering structures from the offshore drilling rig down through the riser cavity, the blowout preventer cavity and into the borehole; and,

g. wherein, the control system is configured to fire the first and second laser cutters.

20. The method of claim 19, wherein the structures are selected from the group consisting of: tubulars, wireline, coiled tubing and slickline.

What is claimed:

1. A laser riser and blowout preventer system for use with an offshore drilling rig, a vessel or platform to control and manage potential emergency and emergency situations, the laser riser blowout preventer system comprising:

a. a high power laser capable of providing a high power laser beam having greater than 1 kW of power;

b. a high power beam switch in optical association with the high power laser, whereby the laser beam from the high power laser is capable of being transmitted from the high power laser to the high power beam switch;

c. a riser;

d. a blowout preventer, comprising a pressure containment cavity;

e. a first laser cutter and a second laser cutter, in optical association with the high power beam switch, whereby a first cutting high power laser beam from the high power beam switch is capable of being transmitted from the high power beam switch to the first laser cutter, and whereby a second cutting high power laser beam from the high power beam switch is capable of being transmitted from the high power beam switch to the second laser cutter;

f. wherein the first laser cutter is positioned adjacent the riser, whereby the first laser cutter is capable of directing the first cutting high power laser beam toward a component of the riser;

g. wherein the second laser cutter is positioned in the blowout preventer, whereby the second laser cutter is capable of directing the second cutting high power laser beam toward a tubular within the pressure containment cavity of the blowout preventer; and,

h. a control network in data and control communication with the high power laser, the high power beam switch and the blowout preventer, wherein the control network provides for firing of the high power laser and actuation of the blowout preventer.

2. The system of claim 1, wherein the control network comprises a programmable logic controller.

3. The system of claim 1, wherein the control network comprises a user interface.

4. The system of claim 1, wherein the control network comprises a memory device comprising a series of instructions for executing a predetermined sequence of firing the first cutting laser beam from the first laser cutter and firing the second cutting laser beam from the second laser cutter and actuating the blowout preventer.

5. The system of claim 1, wherein the control network comprises a plurality of controllers.

6. The system of claim 1, wherein the high power laser is capable of firing a high power laser beam having at least about 10 kW of power.

7. The system of claim 1, wherein the high power laser is capable of firing a high power laser beam having at least about 20 kW of power.

8. The system of claim 1, wherein the high power laser is capable of firing a high power laser beam having at least about 40 kW of power.

9. The system of claim 1, comprising a second high power laser for generating the laser beam.

10. The system of claim 9, wherein the second high power laser is capable of generating a laser beam having at least about 10 kW of power for delivery as the first cutting high power laser beam.

11. The system of claim 9, wherein the second high power laser is capable of generating a laser beam having at least about 10 kW of power for delivery as the second cutting high power laser beam.

12. The system of claim 9, wherein the high power laser, the second high power laser, or both the high power laser and the second high power laser are located on the offshore drilling rig, vessel or platform.

13. The system of claim 9, wherein only one of the high power laser and the second high power laser is on line at any given time.

14. The system of claim 1, comprising a third laser cutter, wherein one of the second laser cutter or the third laser cutter is mechanically and optically associated with an upper portion of the pressure containment cavity of the blowout preventer and another one of the second or third laser cutters is mechanically and optically associated with a lower portion of the pressure containment cavity of the blowout preventer.

15. A laser riser and blowout preventer system to control and manage potential emergency and emergency situations, the laser riser blowout preventer system comprising:

a. a first high power laser for generating a first high power laser beam having a power greater than 1 kW and a second high power laser for generating a second high power laser beam having a power greater than about 1 kW;

b. a riser;

c. a blowout preventer, comprising a pressure containment cavity;

d. a first laser cutter and a second laser cutter; the first laser cutter in optical association with the first high power laser, whereby the first high power laser beam from the first high power laser is capable of being transmitted from the first high power laser to the first laser cutter; and the second laser cutter in optical association with the second high power laser, whereby the second high power laser beam from the second high power laser is capable of being transmitted from the second high power laser to the second laser cutter; and,

e. wherein the first laser cutter is mechanically and optically associated with the riser, whereby the first laser cutter is capable of delivering the first laser beam to cut the riser and, wherein the second laser cutter is mechanically and optically associated with the blowout preventer, whereby the second laser cutter is capable of delivering the second laser beam within the pressure containment cavity of the blowout preventer.

16. The system of claim 15, comprising a third laser cutter, wherein one of the second laser cutter or the third laser cutter is mechanically and optically associated with an upper portion of the pressure containment cavity of the blowout preventer and another one of the second or third laser cutters is mechanically and optically associated with a lower portion of the pressure containment cavity of the blowout preventer.

17. The system of claim 15, wherein the first high power laser and the second high power laser each are capable of firing a high power laser beam having at least about 10 kW of power.

18. The system of claim 15, wherein the first high power laser is capable of firing a high power laser beam having at least about 20 kW of power.

19. The system of claim 15, wherein the first high power laser is capable of firing a high power laser beam having at least about 40 kW of power.

20. The system of claim 15, wherein the second high power laser is capable of firing a high power laser beam having at least about 20 kW of power.

21. The system of claim 15, wherein the first high power laser and the second high power laser each are capable of firing a high power laser beam having at least about 20 kW of power.

22. A laser riser and blowout preventer system to control and manage potential emergency and emergency situations, the laser riser blowout preventer system comprising:

a. a high power laser to generate a high power laser beam having a power greater than about 1 kW;

b. a means to direct the high power laser beam in optical and control association with the high power laser, whereby the high power laser beam from the high power laser is

capable of being transmitted from the high power laser to the means to direct the high power laser beam;

c. a riser comprising a first laser cutter, whereby the first laser cutter is capable of directing a first high power laser beam toward a component of the riser;

d. a blowout preventer comprising a pressure containment cavity and a second laser cutter, whereby the second laser cutter is capable of directing a second high power laser beam toward a tubular within the pressure containment cavity of the blowout preventer; and,

e. the first laser cutter and the second laser cutter in optical association with the means to direct the high power laser beam, wherein the first laser cutter and the second laser cutter are capable for receiving a high power laser beam from the high power laser.

23. The system of claim 22, comprising a third laser cutter, wherein one of the second laser cutter or the third laser cutter is mechanically and optically associated with an upper portion of the pressure containment cavity of the blowout preventer and another one of the second or third laser cutters is mechanically and optically associated with a lower portion of the pressure containment cavity of the blowout preventer.

24. The system of claim 22, wherein the high power laser is capable of firing a high power laser beam having at least about 10 kW of power.

25. The system of claim 22, wherein the high power laser is capable of firing a high power laser beam having at least about 20 kW of power.

26. The system of claim 22, wherein the high power laser is capable of firing a high power laser beam having at least about 40 kW of power.

27. The system of claim 22, comprising a second high power laser for generating the high power laser beam.

28. The system of claim 22, wherein the means to direct the high power laser beam is a high power laser beam switch.

29. An offshore drilling rig, vessel or platform having a laser riser and blowout preventer system to control and manage potential emergency and emergency situations, the laser riser and blowout preventer system comprising:

a. a high power laser in optical association with a first laser cutter and a second laser cutter, whereby a high power laser beam, having a power of greater than 1 kW, from the high power laser is capable of being transmitted from the high power laser to the first laser cutter, the second laser cutter, or both the first and second laser cutters;

b. a riser comprising a plurality of riser sections, wherein the plurality of riser sections are configured for being lowered from and operably connected to the offshore drilling rig, vessel or platform to a depth at or near a seafloor;

c. a blowout preventer, comprising a pressure containment cavity and configured for being operably connected to the riser and lowered from the offshore drilling rig to the seafloor; and,

d. the riser comprising the first laser cutter, for emitting the laser beam and defining a first beam path, wherein the first beam path is directed toward the riser;

e. the blowout preventer comprising a second laser cutter for emitting the laser beam and defining a second beam path, wherein the second beam path is directed toward and within the pressure containment cavity of the blowout preventer; and,

f. a control system;

g. wherein, when the riser and blowout preventer are deployed and operably associating the offshore drilling rig, vessel or platform and a borehole in the seafloor, and the control system is configured to control the firing of the first and second laser cutters.

30. The laser riser and blowout preventer system of claim 29 wherein the control system is configured to control the actuation of the blowout preventer.

31. The system of claim 29, wherein one of the plurality of riser sections comprises the first laser cutter, and wherein the first beam path is directed toward one of the plurality of riser sections.

32. The system of claim 29, wherein one of the plurality of riser sections comprises the first laser cutter, and wherein the first beam path is directed toward a riser joint.

33. The system of claim 29, wherein the first beam path is directed toward a riser joint.

34. A method of performing drilling, workover, intervention, completion or service on a subsea well by using a laser riser and blowout preventer system in conjunction with an offshore drilling rig, vessel or platform to control and manage potential emergency and emergency situations, the method comprising:

a. lowering a blowout preventer, from an offshore drilling rig, vessel or platform to a seafloor using a riser comprising a plurality of riser sections;

b. wherein the blowout preventer comprises: a blowout preventer pressure containment cavity defined by the blowout preventer; and a first laser cutter for emitting a first laser beam that defines a first beam path, wherein at least a portion of the first beam path is in the blowout preventer pressure containment cavity;

c. wherein the riser comprises: a riser cavity defined by the riser; and a second laser cutter for emitting a second laser beam that defines a second beam path, wherein the second beam path is directed toward a component of the riser;

d. operably connecting a high power laser, for providing the first laser beam having a power greater than 1 kW, the second laser beam, having a power greater than 1 kW, or both the first and second laser beams, into a control system;

e. securing the blowout preventer to a borehole having a borehole cavity, whereby the borehole cavity and the riser cavity are in fluid and mechanical communication; and,

f. performing operations on the borehole by lowering structures from the offshore drilling rig down through the riser cavity, the blowout preventer cavity and into the borehole; and,

g. wherein, the control system is configured to fire the first and second laser cutters.

35. The method of claim 34, wherein the structures are selected from the group consisting of: tubulars, wireline, coiled tubing and slickline.

36. A method of performing drilling, workover, intervention, completion or service on a subsea well by using a laser riser and blowout preventer system in conjunction with an offshore drilling rig, vessel or platform to control and manage potential emergency and emergency situations, the method comprising:

a. positioning a blowout preventer in mechanical association and fluid communication with a borehole in a sea floor, the borehole comprising a borehole cavity;

b. the blowout preventer comprising: a blowout preventer pressure containment cavity defined by the blowout preventer; and a first laser cutter for emitting a first laser beam that defines a first beam path, wherein at least a portion of the first beam path is in the blowout preventer pressure containment cavity;

c. connecting the blowout preventer and an offshore drilling rig, vessel or platform with a riser;

d. the riser comprising: a riser cavity defined by the riser, wherein the borehole cavity, the blowout preventer pressure containment cavity and the riser cavity are in fluid communication; and a second laser cutter for emitting a second laser beam that defines a second beam path, wherein the second beam path is directed toward a component of the riser;

e. operably connecting a high power laser, for providing the first laser beam having a power greater than 5 kW, the second laser beam having a power greater than 5 kW or both the first and second laser beams, into a control system, wherein, the control system is configured to fire the first and second laser cutters; and,

f. performing operations on the borehole by moving structures through the riser cavity, the blowout preventer pressure containment cavity and the borehole cavity.

37. The method of claim 36, wherein the structures are selected from the group consisting of: tubulars, wireline, coiled tubing and slickline.

38. The method of claim 36, wherein the structures are selected from the group consisting of: drill pipe and coiled tubing.

39. The method of claim 36, wherein the structures are lowered through the riser cavity, the blowout preventer cavity and into the borehole cavity.