CLAIMS

1. A system for an enhanced interconnect for downhole tools along a drill string used in subterranean operations, comprising:

a first drill string segment comprising a first conductive element;

a second drill string segment coupled to the first drill string segment;

a chamber of the second drill string segment, the chamber being defined in part by an inner wall of the second drill string segment with a diameter greater than the borehole diameter of the second drill string segment; and

a tool connect assembly disposed within an internal bore of the second drill string segment, wherein:

the tool connect assembly comprises a second conductive element electrically connected to the downhole tool, and

the second conductive element is electrically coupled to the first conductive element through at most two electrical interfaces.

2. The system of claim 1, further comprising a first connector coupled to the first conductive element and a second connector coupled to the second conductive element.

3. The system of claim 2, wherein the first connector and the second connector form a connector pair.

4. The system of claim 3, wherein the tool connect assembly comprises a hanger assembly positioned within a chamber of the second drill string segment, and the second connector is at least partially disposed within the hanger assembly.

5. The system of claim 4, further comprising at least one spacer positioned between the hanger assembly and the bottom of the chamber.

6. The system of claim 2, further comprising an adapter positioned between the tool connect assembly and the first drill string segment, wherein the first connector and the second connector are electrically coupled through the adapter.

7. The system of claim 6, wherein the adapter further comprises:

a third connector corresponding to the first connector, wherein the third connector and the first connector form a first connector pair; and

a fourth connector corresponding to the second connector, wherein the fourth connector and the second connector form a second connector pair, optionally,

wherein the at most two electrical interfaces comprise the first connector pair and the second connector pair, further optionally,

wherein the tool connect assembly comprises an annular connect assembly.

8. A method for an enhanced interconnect for downhole tools along a drill string used in subterranean operations, comprising:

introducing a first drill string segment into a borehole, wherein the first drill string segment comprises a first conductive element;

positioning a tool connect assembly within an internal bore of a second drill string segment, wherein the tool connect assembly comprises a second conductive element, and a chamber of the second drill string segment, the chamber being defined in part by an inner wall of the second drill string segment with a diameter greater than the borehole diameter of the second drill string segment;

threadedly engaging the second drill string segment to the first drill string segment;

electrically coupling the second conductive element to a downhole tool, and electrically coupling the second conductive element to the first conductive element through at most two electrical interfaces.

9. The method claim 8, wherein the first drill string segment comprises a first connector coupled to the first conductive element, and wherein the tool connect assembly comprises a second connector coupled to the second conductive element.

10. The method of claim 9, wherein electrically coupling the second conductive element to the first conductive element through at most two electrical interfaces comprises forming a connector pair using the first connector and the second connector.

11. The method of claim 10, wherein the tool connect assembly comprises a hanger assembly positioned within a chamber of the second drill string segment, and the second connector is at least partially disposed within the hanger assembly.

12. The method of claim 11, further comprising positioning at least one spacer between the hanger assembly and the bottom of the chamber.

13. The method of claim 9, further comprising positioning an adapter between the tool connect assembly and the first drill string segment, wherein the first connector and the second connector are electrically coupled through the adapter.

14. The method of claim 13, wherein the adapter comprises:

a third connector corresponding to the first connector, wherein the third connector and the first connector form a first connector pair; and

a fourth connector corresponding to the second connector, wherein the fourth connector and the second connector form a second connector pair, optionally,

wherein the at most two electrical interfaces comprise the first connector pair and the second connector pair, further optionally,

wherein the tool connect assembly comprises an annular connect assembly.

15. The system of any one of claims 1 to 7, wherein the system does not comprise a wire splice.

CLAIMS

1. A system for an enhanced interconnect for downhole tools along a drill string used in subterranean operations, comprising:

a first drill string segment comprising a first conductive element;

a second drill string segment coupled to the first drill string segment;

a chamber of the second drill string segment, the chamber being defined in part by an inner wall of the second drill string segment with a diameter greater than the borehole diameter of the second drill string segment; and

a tool connect assembly disposed within an internal bore of the second drill string segment, wherein:

the tool connect assembly comprises a second conductive element electrically connected to the downhole tool; and

the second conductive element is electrically coupled to the first conductive element through at most two electrical interfaces;

wherein the tool connect assembly further comprises a hanger assembly positioned within the chamber of the second drill string segment; and

wherein at least one spacer is positioned between the hanger assembly and the bottom of the chamber such that the hanger assembly is positioned within the chamber to contact the bottom of the first drill string segment when the first drill string segment is coupled to the second drill string segment thereby electrically coupling the first conductive element to the second conductive element.

2. The system of claim 1, further comprising a first connector coupled to the first conductive element and a second connector coupled to the second conductive element.

3. The system of claim 2, wherein the first connector and the second connector form a connector pair.

4. The system of claim 2, further comprising an adapter positioned between the tool connect assembly and the first drill string segment, wherein the first connector and the second connector are electrically coupled through the adapter.

5. The system of claim 4, wherein the adapter further comprises:

a third connector corresponding to the first connector, wherein the third connector and the first connector form a first connector pair; and

a fourth connector corresponding to the second connector, wherein the fourth connector and the second connector form a second connector pair, optionally,

wherein the at most two electrical interfaces comprise the first connector pair and the second connector pair, further optionally; and

wherein the tool connect assembly comprises an annular connect assembly.

6. A method for an enhanced interconnect for downhole tools along a drill string used in subterranean operations, comprising:

introducing a first drill string segment into a borehole, wherein the first drill string segment comprises a first conductive element;

positioning a tool connect assembly within an internal bore of a second drill string segment, wherein the tool connect assembly comprises a second conductive element, and a chamber of the second drill string segment, the chamber being defined in part by an inner wall of the second drill string segment with a diameter greater than the borehole diameter of the second drill string segment;

threadedly engaging the second drill string segment to the first drill string segment;

electrically coupling the second conductive element to a downhole tool, and electrically coupling the second conductive element to the first conductive element through at most two electrical interfaces;

wherein the tool connect assembly further comprises a hanger assembly positioned within the chamber of the second drill string segment; and

wherein at least one spacer is positioned between the hanger assembly and the bottom of the chamber such that the hanger assembly is positioned within the chamber to contact the bottom of the first drill string segment when the first drill string segment is coupled to the second drill string segment thereby electrically coupling the first conductive element to the second conductive element.

7. The method claim 6, wherein the first drill string segment comprises a first connector coupled to the first conductive element, and wherein the tool connect assembly comprises a second connector coupled to the second conductive element.

8. The method of claim 7, wherein electrically coupling the second conductive element to the first conductive element through at most two electrical interfaces comprises forming a connector pair using the first connector and the second connector.

9. The method of claim 7, further comprising positioning an adapter between the tool connect assembly and the first drill string segment, wherein the first connector and the second connector are electrically coupled through the adapter.

10. The method of claim 9, wherein the adapter comprises:

a third connector corresponding to the first connector, wherein the third connector and the first connector form a first connector pair; and

a fourth connector corresponding to the second connector, wherein the fourth connector and the second connector form a second connector pair, optionally,

wherein the at most two electrical interfaces comprise the first connector pair and the second connector pair, further optionally; and

wherein the tool connect assembly comprises an annular connect assembly.

11. The system of any one of claims 1 to 5, wherein the system does not comprise a wire splice.