between the composite structure and the upper composite layer, with the bottom composite layer comprising a bottom perimeter that extends beyond the upper perimeter of the upper composite layer. The rework part further comprises a bottom adhesive layer adhering the bottom composite layer to the composite structure, and a rework part adhesive layer bonding the upper composite layer to either the bottom composite layer or to an intermediate composite layer. The rework part also comprises an upper adhesive ring encircling the upper perimeter of the upper composite layer, and a bottom adhesive ring encircling the bottom perimeter of the bottom composite layer.

Another aspect of the present disclosure relates to a method for providing a rework part for a composite structure. In this aspect, the method comprises arranging an upper composite layer such that an upper perimeter of the upper composite layer extends beyond a damaged area of the composite structure, and arranging a bottom composite layer between the composite structure and the upper composite layer, the bottom composite layer comprising a bottom perimeter that extends beyond the upper perimeter of the upper composite layer. The method further comprises affixing the bottom composite layer to the composite structure, and bonding the upper composite layer to the bottom composite layer either directly through a rework part adhesive layer or indirectly through the rework part adhesive layer and one or more additional composite layers. The method also comprises bonding an upper adhesive ring around the upper perimeter of the upper composite layer, and bonding a bottom adhesive ring around the bottom perimeter of the bottom composite layer.

Another aspect of the present disclosure relates to a rework part for a composite structure. In this aspect, the rework part comprises an upper composite layer comprising an upper perimeter that extends beyond a damaged area of the composite structure, and a bottom composite layer between the damaged composite structure and the upper composite layer, with the bottom composite layer adhered to the composite structure and comprising a bottom perimeter that extends beyond the upper perimeter of the upper composite layer. The rework part further comprises an intermediate composite layer between the upper composite layer and the bottom composite layer, wherein the intermediate composite layer has an intermediate

perimeter that extends beyond the upper perimeter of the upper composite layer and does not extend beyond the bottom perimeter of the bottom composite layer. The rework part also comprises an upper adhesive ring encircling the upper perimeter of the upper composite layer, an intermediate adhesive ring encircling the intermediate perimeter of the intermediate composite layer, and a bottom adhesive ring encircling the bottom perimeter of the bottom composite layer.

The features, functions, and advantages that have been discussed can be achieved independently in various embodiments or can be combined in yet other embodiments, further details of which can be seen with reference to the following description and drawings.

CLAIMS:

1. A rework part for a composite structure, the rework part comprising:

an upper composite layer comprising an upper perimeter that extends beyond a damaged area of the composite structure;

a bottom composite layer between the composite structure and the upper composite layer, the bottom composite layer comprising a bottom perimeter that extends beyond the upper perimeter of the upper composite layer;

a bottom adhesive layer adhering the bottom composite layer to the composite structure;

a rework part adhesive layer bonding the upper composite layer to either the bottom composite layer or to an intermediate composite layer;

an upper adhesive ring encircling the upper perimeter of the upper composite layer; and

a bottom adhesive ring encircling the bottom perimeter of the bottom composite layer.

2. The rework part of claim 1, wherein the rework part adhesive layer bonds the upper composite layer to the intermediate composite layer, and wherein the intermediate composite layer has an intermediate perimeter that extends beyond the upper perimeter of the upper composite layer and does not extend beyond the bottom perimeter of the bottom composite layer.

3. The rework part of claim 2, wherein the rework part adhesive layer has a rework part adhesive layer perimeter that is substantially flush with the intermediate perimeter of the intermediate composite layer.

4. The rework part of claim 2, wherein the rework part adhesive layer has a rework part adhesive layer perimeter that is substantially flush with the upper perimeter of the upper composite layer.

5. The rework part of any one of claims 2-4, further comprising an additional intermediate composite layer between the intermediate composite layer and the bottom composite layer, wherein the additional intermediate composite layer has an additional intermediate composite layer perimeter that extends beyond the intermediate perimeter of the intermediate composite layer and does not extend beyond the bottom perimeter of the bottom composite layer.

6. The rework part of claim 5, wherein the additional intermediate composite layer is bonded to the intermediate composite layer, and the additional intermediate composite layer perimeter extends beyond the intermediate perimeter of the intermediate composite layer by one half inch or more.

7. The rework part of any one of claims 1-6, wherein the upper composite layer is an uppermost composite layer of the rework part, and the upper perimeter of the uppermost composite layer extends beyond the damaged area by one inch or more.

8. The rework part of any one of claims 1-7, wherein each of the upper composite layer and the bottom composite layer comprises two plies of a resin-impregnated carbon composite.

9. A method for providing a rework part for a composite structure, the method comprising:

arranging an upper composite layer such that an upper perimeter of the upper composite layer extends beyond a damaged area of the composite structure;

arranging a bottom composite layer between the composite structure and the upper composite layer, the bottom composite layer comprising a bottom perimeter that extends beyond the upper perimeter of the upper composite layer;

affixing the bottom composite layer to the composite structure;

bonding the upper composite layer to the bottom composite layer either directly through a rework part adhesive layer or indirectly through the rework part adhesive layer and one or more additional composite layers;

bonding an upper adhesive ring around the upper perimeter of the upper composite layer; and

bonding a bottom adhesive ring around the bottom perimeter of the bottom composite layer.

10. The method of claim 9, further comprising:

arranging an intermediate composite layer between the upper composite layer and the bottom composite layer, wherein the intermediate composite layer has an intermediate perimeter that extends beyond the upper perimeter of the upper composite layer and does not extend beyond the bottom perimeter of the bottom composite layer.

11. The method of claim 10, further comprising bonding the upper composite layer directly to the intermediate composite layer via the rework part adhesive layer.

12. The method of claim 10 or 11, wherein the rework part adhesive layer has a rework part adhesive layer perimeter, the method further comprising arranging the rework part adhesive layer perimeter to be substantially flush with the intermediate perimeter of the intermediate composite layer.

13. The method of claim 11, wherein the rework part adhesive layer has a rework part adhesive layer perimeter, the method further comprising arranging the rework part adhesive layer perimeter to be substantially flush with the upper perimeter of the upper composite layer.

14. The method of claim 10, further comprising:

arranging an additional intermediate composite layer between the intermediate composite layer and the bottom composite layer, wherein the additional intermediate composite layer has an additional intermediate composite layer perimeter that extends beyond the intermediate perimeter of the intermediate composite layer and does not extend beyond the bottom perimeter of the bottom composite layer.

15. The method of claim 14, further comprising bonding the additional intermediate composite layer to the intermediate composite layer, wherein the additional intermediate composite layer perimeter extends beyond the intermediate perimeter of the intermediate composite layer by one half inch or more.

16. The method of any one of claims 9-15, wherein the upper composite layer is an uppermost composite layer of the rework part, and the upper perimeter of the uppermost composite layer extends beyond the damaged area by one inch or more.

17. A rework part for a composite structure, the rework part comprising:

an upper composite layer comprising an upper perimeter that extends beyond a damaged area of the composite structure;

a bottom composite layer between the damaged composite structure and the upper composite layer, the bottom composite layer affixed to the composite structure and comprising a bottom perimeter that extends beyond the upper perimeter of the upper composite layer;

an intermediate composite layer between the upper composite layer and the bottom composite layer, wherein the intermediate composite layer has an intermediate perimeter that extends beyond the upper perimeter of the upper composite layer and does not extend beyond the bottom perimeter of the bottom composite layer;

an upper adhesive ring encircling the upper perimeter of the upper composite layer;

an intermediate adhesive ring encircling the intermediate perimeter of the intermediate composite layer; and

a bottom adhesive ring encircling the bottom perimeter of the bottom composite layer.

18. The rework part of claim 7, further comprising a rework part adhesive layer bonding the upper composite layer to the intermediate composite layer, wherein the rework part adhesive layer has a rework part adhesive layer perimeter that is

substantially flush with the intermediate perimeter of the intermediate composite layer.

19. The rework part of claim 17, further comprising a rework part adhesive layer bonding the upper composite layer to the intermediate composite layer, wherein the rework part adhesive layer has a rework part adhesive layer perimeter that is substantially flush with the upper perimeter of the upper composite layer.

20. The rework part of any one of claims 17 to 19, further comprising an additional intermediate composite layer between the intermediate composite layer and the bottom composite layer, wherein the additional intermediate composite layer has an additional intermediate composite layer perimeter that extends beyond the intermediate perimeter of the intermediate composite layer and does not extend beyond the bottom perimeter of the bottom composite layer.