Pre-engineered Lift plan for Minerva plane removal

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This plan documents the lifting procedures for removing the Minerva detector planes from the Minos cavern. This task is about 25-30% done already. This document is written to comply with the new FESHM chapter 10200 requirements. The lifting fixture used is shown in drawing 3938.330-ME-444081 which is attached.

1. The strongback is equipped with two Hilman rollers on the bottom. When it is laying flat on the floor hook the crane up at the pickpoint at the top and lift straight up. The bottom will roll under the fixture as it is raised to vertical.
2. When the fixture is vertical and on the shaft crane Have a person who is wearing fall protection unlock and open the gate in the shaft guard railing. Move the fixture though the gate into the shaft. Lock the gate back up as soon as the fixture clears the gate.
3. Lower the fixture to the bottom of the shaft and secure it to the cart. The cart has an arrowhead shaped feature attached to the cross bars that mates with a similar feature on the fixture. It can be seen in the drawing of the fixture.
4. When the fixture is sitting on the arrowhead secure the fixture to the cart with two bolts.
5. Move the cart into the cavern using the forklift.
6. Loosen the four bolts on each of the six lower clips of the fixture.
7. Remove the bolts holding the fixture to the cart and move the fixture to the front of Minerva plane.
8. Lift the fixture until the lower clips engage the plane. Tighten all of the bolts on the clips.
9. Move the crane hook slightly to the north so the top of the fixture is against the plane. Attach the four upper clips and tighten the bolts as shown in section A-A on the drawing.
10. Once all the clips are securing the plane to the fixture, remove the four axial bolts.
11. Lift the plane slightly off the rails, move it away from the detector, and lift to move the plane.
12. If the plane is not going to be reused in the new experiment mount the fixture again to the cart.
13. Reverse the process to take the plane back to the surface to disassemble it for disposal.
14. If the plane is to be reused, move the plane into the storage rack.
15. Center the plane up so the holes in the plane match the previous axial bolts.
16. Install all four axial bolts.
17. Remove the four upper clamps and loosen the bolts on the six lower clamps.
18. Lower the fixture until the lower clamps disengage from the plane.
19. Move the fixture back away from the plane.
20. The fixture is now available for use on another plane.