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AERI Desiccant Replacement

I. Purpose:

This procedure describes how to replace spent desiccant when the AERI Interferometer reports high relative humidity levels (>25% relative humidity) which have potential to damage the internal optics of the instrument.

II. Cautions and Hazards:

- No cautions or hazards to personnel. There is some hazard to the equipment, since some internal components of the interferometer are sensitive to water vapor. After the desiccant container has been removed from the interferometer for replacement, the opening on the underside of the interferometer must be covered (with paper and tape for example) to prevent humid air from entering the interferometer.

III. Requirements:

- Two people are required for this procedure.
- Permanent marking pen.
- Allen wrench set.
- Flashlight (torch).
- Screwdriver, small Phillips.
- Electrician's tape.
- Paper, paper towel, or plastic sheet (for covering the opening under the AERI).
- Desiccant stored in A-Van (small blue and clear beads).
- Safety glasses.

IV. Procedure:

A. Preparations:

1. Gather tools listed above.
2. Turn dehumidifier in AERI Shelter to high setting.
3. Turn off blower with the switch on the right-hand side of the motor.
4. Turn power switch on Hatch Controller.
5. If hatch is open, use remote control to close hatch.

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6. Make sure the main front AERI shelter door remains closed during the procedure to keep conditions as dry as possible.

B. Accessing the interferometer desiccant:

1. Remove the three blue insulation panels around the AERI. One person should help by pushing the panels from the blower compartment. The other person should work from inside the A-Van. The side panels should be removed first, followed by the top middle panel. If necessary, remove one of the plastic knobs from the top middle panel.
2. If the position of the AERI is not indicated by a bold permanent outline of the black plastic base on the white tabletop, use a permanent marker to mark the existing placement.
3. Without removing any cables, pull the AERI directly backwards into the AERI shelter, sliding it across the white tabletop. This should be done by two people, one from inside the shelter, the other in the blower compartment. Care should be taken to avoid contact between the Blackbody cables and the shelter walls. The AERI must be pulled back until the 4" hole cut through the black plastic plate is exposed beyond the edge of the white tabletop. Be careful not to pull the AERI too far back that it tips over off the table!
4. With the flashlight (torch), observe the circular metal plate fastened to the underside of the AERI interferometer. The metal plate supports the desiccant container above it inside the interferometer. Partially loosen the Allen-head screws (5/64?) fastening the plate to the interferometer. Be careful not to allow the plate and desiccant container to completely fall out.

C. Replacing the interferometer desiccant:

NOTE: The steps in this section should be carried out as quickly as possible to reduce exposure of the interferometer internals to water vapor.

1. Carefully loosen remaining Allen-head fasteners and remove the circular metal plate and desiccant container by lowering them straight down. Set them someplace level and safe.
2. Quickly cover the exposed opening on the underside of the interferometer to prevent water vapor or humid air from entering the interferometer. For example, a piece of paper, plastic, or foil works well taped across the opening.

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3. Remove small Phillips-head screws from the lid of the white porous desiccant container. (I usually just remove three so that I can open the container by rotating the lid without entirely removing it).
4. Open the plastic jar of new desiccant stored. Notice the difference in color between the new (fresh) and old (used) desiccant crystals. Throw away the old desiccant, replacing it with new fresh desiccant. Avoid touching the white porous container with bare hands to prevent transferring water vapor from the hands to the container.
5. Replace the lid to the desiccant container.
6. Replace the desiccant container and circular metal plate taking care that the small O-ring fits properly in the groove.

D. Replacement of AERI:

1. With two people, one on each end of the AERI, reposition the system so that it exactly matches the previous outline on the tabletop.
2. Replace the blue insulation panels, starting with the top middle panel. The panels do not need to mate perfectly evenly. It is more important that the seal be tight and complete. No gaps between panels and walls are desired. If gaps are present, it is okay to plug them with packing foam.
3. Turn the hatch controller on.
4. Turn on blower.
5. Replace dehumidifier to medium or normal setting.

V. References:

None.

VI. Attachments:

None.