**APPENDIX B.1**

**RAF PROJECT SAFETY COMMITTEE**

**HAZARDOUS MATERIALS AND DEVICES**

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DO NOT WRITE IN THIS BLOCK

Project: \_\_\_NOMADSS\_\_\_ Installation Period: 8 Apr – 22 May 2013

Aircraft: \_\_\_\_C-130\_\_\_\_\_\_\_ Beginning Date: \_\_1 Jun 2013\_\_\_\_\_\_

Instrument Number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Ending Date: \_\_15 Jul 2013\_\_\_\_\_

1. Instrument: \_\_Carbon monoxide\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Function: \_\_co mixing ratios\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Principal Investigator: \_\_Teresa Campos\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Address: \_\_RAF\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Telephone: \_\_x1048\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Instrument Operator(s): \_Teresa Campos, Frank Flocke, Daniel Stechman, Melodye Rooney, Andrew Weinheimer, Denise Montzka, and David Knapp

5. Is this instrument commercially produced? \_Yes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. If so, please list name and address of manufacturer:

 \_\_Aero-Laser, Inc. Garmischpartenkirken, DE\_

7. Please list serial number of the instrument:

 ­­­­­­­­­­­­­­­­­­­­­­­\_152\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please attach a copy of the manufacturer’s instruction manual for the device. If this is not possible, attach a copy of those pages of the instruction manual which describe the principles of operation, hazard warnings, safety features, and safety rules.

8. If the instrument is not commercially produced, please provide information requested below:

 Designed by:

 Organization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Telephone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Built by: \_\_\_\_\_\_\_\_\_\_\_\_

 Organization: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9. Describe principles of operation, hazard warnings, safety features:

 Quantifies carbon monoxide via vacuum UV fluorescence.

Hazards: 1) Instrument uses 3 compressed gas cylinders, two of which are asphyxiants.

10. If the instrument is commercially produced, has it been modified? \_\_\_\_Yes\_\_\_\_\_\_\_\_

11. If modified, describe the modification.

 \_Pressure and flow controllers have been replaced with our own units.\_

**All investigators please answer the following:**

12. Does the instrument contain, use, or produce:

 Radioactive materials \_No\_\_\_\_\_ Compressed gases \_\_Yes\_\_\_\_

 Other ionizing radiation \_No\_\_\_\_\_ Non-ionizing radiation \_\_No\_\_\_\_

 Flammable liquids \_No\_\_\_\_\_ Laser \_\_No\_\_\_\_

 Radar \_No\_\_\_\_\_ Flammable gases \_\_No\_\_\_\_

 Explosive materials \_No\_\_\_\_\_ Toxic materials \_\_No\_\_\_\_

13. If any of the categories were checked, specify the material below (for example, amount, energy levels, physical form, etc.).

 \_\_We plan to carry 2000 psi of breathable calbration compressed gas (qty 1, CO concentration 73 ppmv), and 2000 psi each of UHP nitrogen and a mixture of 0.25% CO2 in UHP argon in fiber-wrapped aluminum cylinders having a 2-L internal volume at 1 atm.

14. Please list all other chemicals you will use on board this aircraft in your experiment.

 \_Drierite desiccant traps are also used in this instrument.

15. If your experiment consumes or discharges materials, will you need to carry additional materials on board? No.

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16. What and how much extra materials will you need to carry?

 \_None on board aircraft.\_

17. What kind of container will you need to carry these materials?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. If the device utilizes a laser, please classify the laser according to ANSI Z 136.1-1973 (circle one).

Class: I II III IV

1. If your laser will be operating at a wavelength that is not eye safe, what procedures will

 be established to minimize the danger to yourself and other project participants?

 \_\_\_\_\_\_please attached a separate document covering this question\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. If you are using compressed gas cylinders, what is the maximum pressure expected for each cylinder type?

 \_\_2000 psi\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

21. Will you be re-filling any compressed gas cylinders yourself, either at JeffCO or during the field deployment?

 \_\_No\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. Are there any other hazards associated with the instrument itself, the required ground support equipment or the experiment which have not so far been covered in this questionnaire?

 \_No.

23. How would you describe the probability of an accident resulting from the presence and use of your instrument on board the NCAR aircraft?

 \_\_N/A

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24. How would you describe the severity of such an accident?

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 25. What precautions will you take to decrease the probability and the severity of an accident? If any documented safety procedures from your home facility or university are available, please attach a copy of said materials to this form.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Date Signature of principal investigator or operator

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Printed name of principal investigator or operator

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Reviewed by

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Date