

Center Director's Safety Bulletin

Mission To VPP Still On Course For Year 2003
December 24, 2001

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Calendar of Events

December

It's Snow Fun To
Get Hurt!

December Safety Training

No specific safety
training scheduled at
this time.

Contact the Learning
Center at 3-2996 for
videos on "Icy Road
Ahead" and "Winter
Safety"

Oxygen Cleaning Pollution Prevention Success Story

The research group at the Engine Components Research Lab (ECRL) in Building 102 installed a new 4-inch diameter, stainless steel, high-pressure oxygen supply line. Equipment, such as this new supply line that is to be used in oxygen rich environments, must be cleaned to safety standards prior to use to minimize contamination which reduces the chance of fires or explosions. In the past, harmful and ozone-depleting chemicals such as trichlorotrifluoroethane $C_2F_3Cl_3$ (CFC 113), dichlorofluoroethane $C_2H_3FCl_2$ (HCFC 141b), or 1,1,1-trichloroethane (TCE) were commonly used for the cleaning and verification of such oxygen systems. Title VI of the Clean Air Act is putting an end to the production and use of these chemicals. Since these chemicals have a history of performing this task well, and this task is safety driven, the implementation of new substitute chemicals for conformance with the Clean Air Act has been difficult for all involved.

The ECRL research group took the opportunity to have its oxygen line cleaning performed with the latest environmentally friendly chemicals by the White Sands Testing Facility (WSTF), the leader in testing oxygen cleaning substitutes and procedures for NASA. Additionally the ECRL group's arrangements provided a new chemical training opportunity for the Plum Brook oxygen equipment cleaning team plus salvage of the chemicals used.

The WSTF team cleaned the interior of the pipe with heated OAKITE-33 acid solution. After the pipe was cleaned with the acid solution, it was rinsed with deionized water. A basic OAKITE solution was then sent through the pipe to neutralize residual OAKITE-33 and perform a final cleaning. The pipe was again rinsed with deionized water and the cleaning verified using HFE-7100. This fluid is run through the pipe and then collected and tested for impurities. After testing confirmed the cleanliness of the pipe, heated nitrogen gas was used to dry the pipe. Finally, the pipe was sealed to maintain the cleanness while waiting for use.

Chapters 4 and 26 of the Glenn Research Center Environmental Programs Manual state that compliance with the Clean Air Act and phasing out the use of ozone-depleting chemicals are GRC Policies. This cleaning procedure showed by example that GRC's environmental policy could be followed while still obtaining the required degree of cleanliness. This cleaning is both effective and accepted by other NASA Centers. The newly formed Oxygen Cleaning Advisory Committee has been discussing this cleaning method along with other available options.

Additional information may be obtained from Mr. Dallas Jenkins (3-3771) or Mr. Colman Zsiros (3-3028) of the Glenn Safety Office, or Ms. Christie Myers (3-8874) of the Environmental Management Office.

REMEMBER: Mission Success Starts with Safety