Laboratory meets 2005 CFC reduction goal

The Laboratory recently met a 2005 Department of Energy milestone for reducing the amount of ozone-depleting substances it releases.

The DOE in 2000 established a goal of 2005 goal for federal facilities to reduce the use of ozone-depleting substances and emissions of greenhouse gases by replacing chillers made prior to 1984 that use Class I ozone-depleting substances (CFC-11, CFC-12, CFC-113, CFC-114, CFC-115). Class I ozone-depleting substances are capable of destroying the most ozone molecules, so these chlorofluorocarbons (CFCs) were the first refrigerants to be targeted for removal, said Steven Story of Meteorology and Air Quality (RRES-MAQ).

The Laboratory met the DOE goal one year ahead of schedule and is now working to meet a DOE 2010 goal to eliminate all equipment that uses CFCs.

Several projects were completed to reduce CFC use. Old chillers, which provide cooling for buildings, have been replaced with more efficient models, while chillers containing CFCs were retrofitted to use environmentally safer hydrogenated chlorofluorocarbons (HCFCs). Additionally, entire cooling systems were upgraded, said Story. Hydrogenated chlorofluorocarbons and CFCs have similar cooling capabilities, but HCFCs are better for the environment than CFCs because HCFCs only have about 2 percent of the potential of CFCs to cause ozone-depletion and global warming. By replacing and retrofitting old chillers and upgrading old systems, the Laboratory saves energy and reduces potential emissions of CFCs to the atmosphere, said Story.

Many Laboratory divisions have participated in various chiller replacement, retrofit and upgrade projects. The Computing, Communications and Networking (CCN) Division retrofitted three chillers at the Lab Data Communication Center (LDCC). These chillers were mechanically rebuilt so that the 1,550 pounds of CFC-11 in each chiller could be replaced with HCFC-123. The cooling capacity of the chiller at the LDCC was sufficient to also provide cooling for the adjacent Central Computing Facility (CCF). The three old chillers at the CCF were taken out of service, resulting in the elimination of 3,000 pounds of CFC-11. Additionally, by linking the chillers between the CCF and the LDCC, the projected annual financial savings total about $125,000 in energy and about $94,000 in maintenance.

The Chemistry (C) Division retrofitted three chillers that formerly used about 700 pounds of CFC-11 each so that HCFC-123 could be used instead. In 2004, the Los Alamos Neutron Science Center (LANSCE) at Technical Area 53 purchased five new HCFC-123 chillers that will replace the CFC-11 chillers. Replacing the old chillers eliminated about 6,000 pounds of CFC-11 and increased energy efficiency, Story of RRES-MAQ said. The project included installation of new chilled water pumps, new electrical switchgear, and piping configuration changes that reduce maintenance down time and improve LANSCE beam operating time.

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Meteorology and Air Quality (RRES-MAQ) along with Maintenance and System Engineering (FWO-MSE) have been tracking the Laboratory's CFC inventory since the United States signed the Montreal Protocol in 1996, and these groups have been providing DOE with annual reports on the progress of the Laboratory's CFC phase out goals. RRES-MAQ and FWO-MSE staff helped divisions with the phase out of those chillers that were applicable to the 2005 DOE goal.

By meeting the 2005 goal, the Laboratory has reduced its original inventory of CFCs by more than 80 percent. Additional chiller replacement projects are being identified based on the potential for energy savings and the volume of CFCs that can be eliminated from the Laboratory's inventory. "We're really pleased to implement these chiller replacement projects so that the Laboratory can protect the ozone layer and save energy simultaneously," said Kurt Beckman of Experimental Science East (FWO-EAST).

Future chiller replacement and retrofit projects are being planned at Dynamic Experimentation (DX), Nuclear Materials Technology (NMT) and Materials Science and Technology (MST) divisions.