

## Applications: Mining, Boring, Manufacturing, Military, Diesel Engine Protection, Halon Replacement

### The Challenge:

Selecting an effective replacement fire protection system for NASA's crawler transporters, the largest self-powered machines in the world. They carried the Space Shuttle with 1,350,000 kilograms of rocket fuel; failure was not an option. Huge size, multiple complexly shaped and poorly sealed interior volumes, limited spare space and punishing vibrations made protection extremely difficult. When designed they used a halon system which had to be replaced. They also wanted a solution with no or low GWP. What to use for a halon replacement?



### Alternatives Considered:

FM-200	Rejected, tank size, piping size, Global Warming Potential
CO <sup>2</sup>	Rejected, tank size, piping size
Ecaro (FE-25)	Rejected, tank size, piping size, Global Warming Potential
NOVEC 1230	No GWP, possible to fit in tanks. (See detail chart below.)

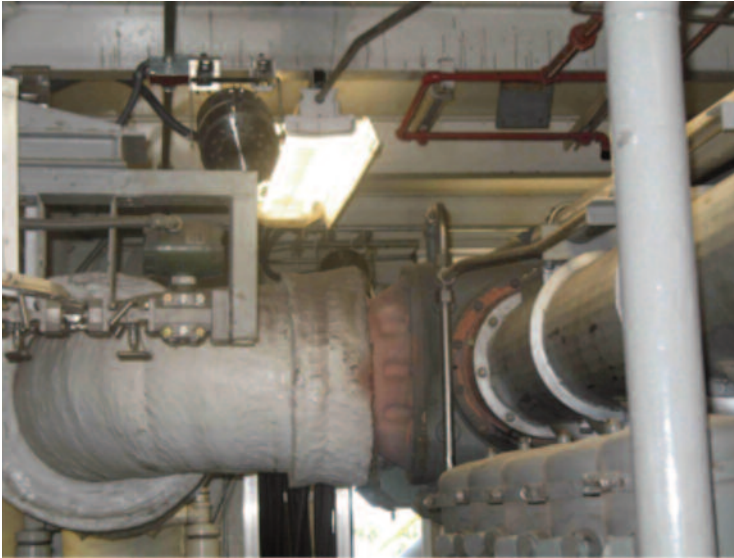
### NOVEC 1230 vs. Stat-X®

Issue	Novtec 1230	Stat-X
Room Integrity	With ventilation, diesel engines, and many compartments and penetrations, even with a steel structure, achieving room integrity was difficult. Gas systems, and NOVEC flashes into a gas on release, require careful room sealing whose expense often exceeds the direct costs of the extinguishing system.	Stat-X particulate is much less sensitive to leakage rates and room pressure changes during discharge are minimal. The design program compensates for leakage rates. Stat-X solutions have been created for leakage rates as high as 7% and high airflows.
Pipe Runs	The crawler had a number of widely separated areas to protect with many individual compartments requiring extensive piping in tight quarters. NOVEC allows smaller diameter pipes as it can run as a liquid in them.	Stat-X is connected to panels with low voltage electrical connections allowing small diameter fixed or flexible electrical cabling.
Vibration—4.4 MM Kg loaded weight with treads driven by diesel engines	Maintaining integrity of the pipe runs and seals despite the vibrations.	Stat-X generators have been tested to the most rigorous military specs including extensive vibration and drop tests.
Expense	For this application—not a problem.	Much less expensive, particularly due to ease of installation.

## The Solution:

NASA installed a NOVEC 1230 system. They were unaware of Stat-X when they made the decision. With the NOVEC installation they were unable to resolve piping leakage issues caused by the difficult pipe runs and vibrations. The NOVEC system also repeatedly failed room integrity test. They were unable to commission the system despite extensive efforts.

They tore out the NOVEC and replaced it with a Stat-X at a dramatically lower cost for both shuttle crawlers.



*Keller's Inc. of Wilmington, DE was instrumental in the installation of this Stat-X Solution.*

**Stat-X**<sup>®</sup>