

Case study

# NASA Ames Research Center

Moffett Federal Airfield, California



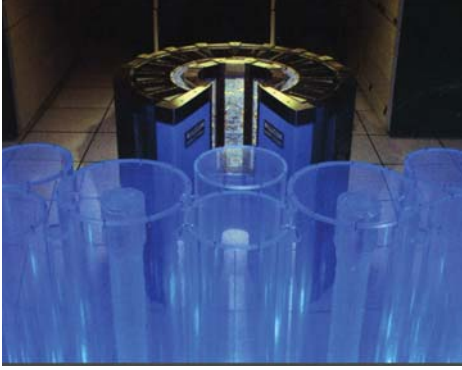
## Installation services and alternative energy keep NASA site powered

Located in the heart of Silicon Valley in northern California, NASA Ames Research Center is one of four NASA sites across the country providing the nations' space research. The Center occupies about 430 acres of land and employs approximately 5,000 people. It also hosts many other federal, civilian, and military resident agencies with the adjoining 1,500-acre former naval air station, now known as Moffett Federal Airfield. Through Johnson Controls' innovative strategies – including installation support services, building automation and energy services – NASA Ames is saving energy and taxpayers dollars.

## Flooded with emergencies

Johnson Controls likes to hit the ground running when it starts a job. That approach was absolutely necessary on the company's first day of a new contract at NASA Ames when torrential rains struck the area, flooding 20 basements and inundating underground electrical vaults, storm channels and levees. At 1:30 a.m. in the first hours of the contract, Johnson Controls established an emergency utility operations center. Team members worked 12-hour shifts for more than a week until the floodwaters subsided.

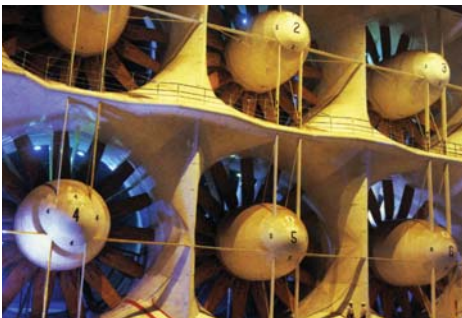
That ability to solve its customers' problems continued as Johnson Controls embarked on its everyday work, including responding to trouble calls and providing soil remediation, composting and hazardous material support services. Johnson Controls returned value to NASA Ames with more than 150 documented process improvements that avoided \$1.2 million in costs over eight months. In addition, the project became fully certified in both ISO 9000 and ISO 14000 standards within the first two years of the contract.



Supercomputer at NASA Ames.



Aerial of windtunnels.



Six drive fans and 22,500 hp motors total 134,000 hp for Ames' 40' x 80' wind tunnel.

## Reducing energy costs

The project also is helping the environment. Through a 19-year Energy Savings Performance Contract (ESPC) with Johnson Controls, NASA Ames will save \$522,852 in energy costs. A significant portion of this savings was achieved by retrofitting the fluorescent lighting in many of the Center's older buildings with more energy efficient ballasts and lamps. Also, after a thorough examination of the numerous additions and retrofits to an existing building automation system, Johnson Controls engineers found several ways to improve performance and save energy. They reprogrammed and recommissioned several systems and provided night setback and shutdown of terminal reheat systems, along with resetting functions for hot water systems.

Ultimately, Johnson Controls was able to expand the existing system, thereby saving NASA Ames' investment and providing the funding to pay for other measures, such as renewable energy projects. For instance, run-off water from the base is currently channeled to two basins where particulates are removed before the water is released to the neighboring wetlands. To function properly, these basins need periodic pumping and cleaning. The north basin was somewhat isolated and did not have a ready source of electricity to operate its pump. Installing a windmill-driven mechanical pump to drain the basin allowed the work to be done with minimum environmental impact.

In addition, an energy reduction of 12.7% resulted in reduced emissions, including:

- 90,268 Mg of CO<sub>2</sub>
- 255,121 Kg of SO<sub>2</sub>
- 248,040 Kg of NO<sub>x</sub>

NASA Ames' busy and highly secure areas provide several logistical challenges, but Johnson Controls successfully coordinates schedules with NASA site personnel and subcontractors, along with maintaining timetables and providing communications to the on-site Johnson Controls operations team.

## Inspiring future generations

On top of the energy savings, reduced repair and replacements of control system components NASA will avoid costly unplanned equipment expenses and will reduce trouble calls which will free up staff to perform other tasks. Johnson Controls is committed to helping NASA Ames achieve its goals to obtain the highest efficiency and reduce operating expenses while making sure its occupants are provided a comfortable, productive environment.

The ongoing success of these projects complements NASA Ames' mission "... to develop technologies that enable the Information Age, expand the frontiers of knowledge for aeronautics and space, improve America's competitive position, and inspire future generations."