

***NASA Engineering Network and NASA Technical Report Server****Resources for the Aerospace Engineering Community*

oce.nasa.gov | ntrs.nasa.gov

 Transparency  Participation  Collaboration

The NASA Engineering Network is an integrated suite of tools that includes a search capability that mines resources from 45 engineering repositories and 1.4 million records, the Lessons Learned Information System of official NASA vetted lessons, communities of practice formed along engineering disciplines, and a portal to integrate these components. The NASA Technical Reports Server (NTRS) is a public database of NASA's current and historical technical literature. NTRS provides access to approximately 500,000 aerospace related citations, 90,000 full-text online documents, and 111,000 images and videos. The type of information found in NTRS includes conference papers, images, journal articles, photos, meeting papers, movies, patents, research reports, and technical videos.

**Overview**

Following the loss of NASA's Space Shuttle Challenger and crew in 1985, the NASA Lessons Learned program was formulated to assure that NASA's key knowledge is documented and made available to everyone, both the public and NASA personnel. Following the loss of NASA's Space Shuttle Columbia and crew in 2003, the Columbia Accident Investigation Board was convened to identify underlying causes of the accident. The Board determined that NASA's organizational structure and culture prevented it from being a learning organization. One proposed solution to this problem was the NASA Engineering Network (NEN), a suite of information retrieval and knowledge-sharing tools aimed at facilitating communication among engineers at all the NASA centers and affiliated contractors, thus taking knowledge sharing from availability to participation and collaboration.

The NASA Engineering Network grew out of extensive benchmarking with other government agencies as well as private industry. It includes a search capability to mine resources from multiple engineering repositories, the Lessons Learned Information System, communities of practice formed along engineering disciplines, an expertise locator, and a portal to integrate these components.

The NASA Engineering Network went live in 2005. Since that time, more than 50 repositories and 1.3 million records have been indexed and a dozen communities of practice have been established. Since 2006, it has become clear that by integrating key lessons with other search results and the communities of practice, the Agency is building a stronger learning culture. As the next generation of spacecraft is designed, the NASA Engineering Network will be there to support its engineering endeavors. Due to the technical nature of the information on the NEN, we must abide by International Traffic in Arms Regulations (ITAR) regulations and much of the NASA Engineering Network suite is available only within NASA. The Lessons Learned component and Office of the Chief Engineer Web site have been made available to the public.

The NASA Technical Reports server (NTRS) is NASA's Agency-wide primary release avenue to the public for its research and development (RandD) final technical reports and

other scientific and technical information. NTRS has been releasing information to the public since its inception via the Internet in 1994 and through its predecessor database before that.

NTRS integrates three separate information collections and enables search and retrieval of information through a common interface:

1. NACA Collection: Citations and reports from the National Advisory Committee for Aeronautics (NACA).
2. NASA Collection: Citations and documents created or sponsored by NASA. The NASA collection time period starts in 1958 and continues to the present.
3. NIX Collection: Citations and images, photos, movies and videos downloaded from the NASA Image eXchange and served out through NTRS. NIX is a separate system and users can go directly to the NIX to search imagery as well as through NTRS.

NTRS is heavily harvested by commercial search engines (e.g., Google, Bing, and Yahoo), U.S. Federal and international aerospace and space organizations, universities, and the public. It is run and maintained by the NASA Center for Aerospace Information (CASI), a NASA entity that collects, organizes, disseminates, and archives NASA's RandD information.

### How This Fits into Open Government

The NASA Engineering Network (NEN) meets the Open Government initiative for transparency in its lessons learned system and case studies published on the public Office of the Chief Engineer Web site. Official vetted lessons learned evolve from both positive and negative outcomes experienced during work on NASA projects. The database goes back to the 1970s and allows the public to search and review lessons. In addition to transparency, NEN enables collaboration across all NASA centers and industry experts through its facilitated communities of practice. Engineers can ask experts technical questions, find information about test facilities and tools, and share relevant documents.

### Lessons Learned Information Service

llis.nasa.gov



*Mars Science Laboratory (MSL) in the Solar Thermal Vacuum (STV) test facility at NASA JPL*

Lesson Learned #2237 in NASA's Lessons Learned Information Service (LLIS) highlights 10 recommendations in the areas of system test preparation and test execution and review. This is one example of hundreds of lessons learned publicly available. The LLIS is a Web service where users can browse by date, subject, center, and key words. With greater NASA partnership with industry, new partners can find and use lessons learned as they design and develop spaceflight vehicles and can lead to transfer of government learned knowledge as well as allow non-NASA entities to find subject matter experts within NASA.

NTRS information, which is the results of NASA's RandD activities, is released to the public for use, transfer of knowledge, and subsequent use. This allows the work that NASA does to be transparent and for public users to actively put the research and development to use commercially or in their private lives.

### **Open Government Goals**

- Three months
  - Increase outreach to NEN users.
  - Enlist NEN champions for Office of the Chief Engineer site to ensure more information is made available on an ongoing basis.
- Six months
  - Improve NEN collaborative technology with new portal software.
  - Roll out five additional technical communities of practice in NEN.
  - Make NTRS visible and accessible to the public via Google Scholar.
  - Enable NTRS to be full-text searchable to better locate information.
- One year
  - Improve NEN search capability to give internal users better access to the information they seek.
- Two years
  - Improve NEN extranet capability to allow more external users from other government agencies, industry, and academia to participate in communities of practice.
  - Provide a new NTRS interface so information may more quickly be entered into the database, be more efficiently accessible and available for use by the public, and more easily harvested by the numerous entities that search for NASA's RandD information.

### **Useful Links**

1. NASA Technical Report Server (NTRS): [ntrs.nasa.gov](http://ntrs.nasa.gov)
2. NASA Lessons Learned Information Service (LLIS): [llis.nasa.gov](http://llis.nasa.gov)
3. NASA Engineering Network (Internal Link): [nen.nasa.gov](http://nen.nasa.gov)
4. NASA Scientific and Technical Information (STI): [www.sti.nasa.gov](http://www.sti.nasa.gov)