

Rescuing EDL Data

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Background

- The EDL-R task is funded by the NASA Engineering and Safety Center.
 - The task began in April, 2007
 - 3 NASA centers are involved:
 - Ames Research Center
 - Jet Propulsion Laboratory
 - Langley Research Center

Motivation

- Older NASA EDL material has been lost due to:
 - Damage
 - Misplacement
 - Decay
 - Obsolescence
 - Disregard
- The **EDL Repository (EDL-R)** is intended to rescue this type of material in addition to providing access to contemporary EDL mission data so that it can be used to design future EDL systems

Examples of At-Risk Missions

- Early planetary atmospheric entry tests
- Mercury (1959-1963)
- Apollo (1961-1972)
- Project Fire (1962)
- Gemini (1965-1966)
- Viking I & II (1976)
- Pioneer Venus (1978)
- Galileo [entry & descent] (1989)
- Magellan [aero-braking data] (1989)

EDL-R Content

- Types of material
 - Raw engineering flight data
 - Time reference data
 - Calibration, scale factors, etc.
 - Aerodynamic data base
 - Mass properties (detailed)
 - Software design documents
 - Process or reconstructed data
 - Development and test data
 - Reports and analysis
 - Bibliographic references to published papers

EDL-R Disciplines

- Aerodynamics
- Propulsion & decelerators
- Guidance & control
- Thermal Protections Systems
- Separation systems

EDL-R File Formats

- Formats
 - Text: .txt, .rtf, PDF, .doc, HTML
 - Raster Images: .tif, .jpg
 - Vector Graphics: .cgm
 - Audio: .wav, .mp4
 - Video: .avi, .mov
 - Spreadsheet: .xls, .csv
 - Pseudo code and software source code
 - Presentation: .ppt, Keynote (mac)
- Size
 - Files or sets of files larger than 2GB must be compressed
 - Limitation due to Apache web server and some browsers

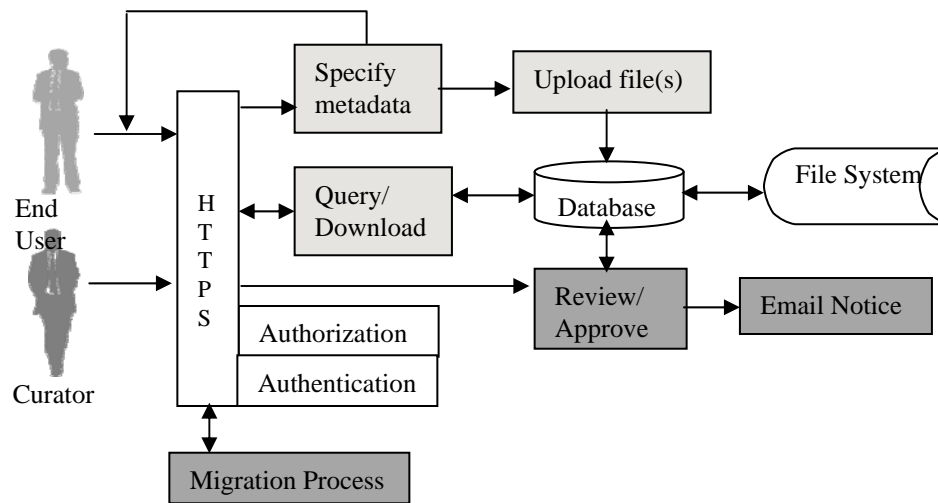
Implementation of the EDL-R

- A Trade Study was performed in '07 to select an open-source digital library
 - Requirements: open-source, web-based, archival standards-compliant, mature, large user community, active developer community
- 24 tools were considered and 3 were selected for in-depth examination:
 - DSpace
 - EPrints
 - Greenstone



Users preferred
workflow, navigation,
ease of installation

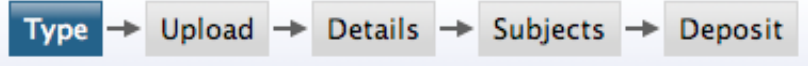
How the EDL-R Works



Security

- Passwords
 - Access to the system is password-protected
- Data encryption
 - All data transferred between the client and server are encrypted
- User Authorization levels
 - Each user is assigned an authorization level based on their:
 - Nationality
 - Affiliation with NASA, e.g. employee, contractor
 - System administration level

Submission Process

- 5-step Workflow: 
 - Type: of material being submitted
 - Upload: of file(s) and sensitivity level
 - Details: metadata describing the material
 - Subjects: associate subject keywords
 - Deposit: the item for Review
- Personal work-area to save incomplete submissions

Review Process

- The EDL-R Curator will review submissions for:
 - Completeness
 - Accuracy
 - Approvals and cover sheets, if applicable
 - Copyright
 - Document Release approval
 - ITAR, NASA-sensitive coversheet
- The Curator may return the submission to the user's work-area if critical information is missing
- The submission will be released for access once it has been cleared

Searching Repository

Browse Method

- Browse: allows the user to navigate through various topics:
 - Author
 - Mission
 - Subject
 - Year

Browse Example

Subject: Aerodynamics (General)

- [Entry Descent and Landing Subjects](#) (38)
 - [Aerodynamics/Astrodynamics](#) (18)
 - **Aerodynamics (General)** (17)
 - [Aero-thermodynamics/Aeroheating](#) (5)
 - [Aerodynamic Configurations](#) (5)
 - [Aerodynamic Flow](#) (10)
 - [Aerodynamic Forces](#) (3)
 - [Stability and Control](#) (4)

Number of items at this level: **2**.

Kanipe, David B. (1983) [Plume/Flowfield Jet Interaction Effects on the Space Shuttle Orbiter during Entry](#). Journal of Spacecraft & Rockets, 20 (4). pp. 351-355. [Publication]

Romere, Paul O. and Young, James C. (1982) [Space Shuttle Entry Longitudinal Aerodynamic Comparisons of Flight 2 with Preflight Predictions](#). Journal of Spacecraft & Rockets, 20 (6). pp. 518-524. [Publication]

Query Method

- Query: allows the user to specify keywords to search on
 - Quick Search
 - Simple Search
 - Advanced Search

Advance Search Example

Advanced Search

Don't panic! Just leave the fields you don't want to search blank. [Click here for a simple search.](#)

Full Text: all of

Title: all of

Individual Authors: all of

Corporate Authors: all of

Description: all of

Uncontrolled Keywords: all of

Subjects:

- Aerodynamics/Astrodynamics
- Aerodynamics/Astrodynamics > Aerodynamics (General)
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aero-thermodynamics/Aero
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Configurations
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Configurations
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Configurations
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Flow
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Flow > Hypers
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Flow > Subson
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Flow > Supers
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Flow > Transo
- Aerodynamics/Astrodynamics > Aerodynamics (General) > Aerodynamic Forces

All of these

Book

Book Section

Dataset

Model/Simulation






Other

Full Text matches "Rovers" AND Title matches "Landing"

Displaying results 1 to 5 of 5.
[Refine search](#) | [New search](#) | [Save search](#)

Order the results: by year (most recent first)

Export 5 results as [Atom](#) [RSS 1.0](#) [RSS 2.0](#)

1. Manning, R (2005) [Landing on Mars](#). [Presentation] (Unpublished) 
2. Way, David and Powell, Richard W. and Chen, Allen and SanMartin, A. Miquel (2006) [Mars Science Laboratory: Entry, Descent, and Landing System Performance](#). IEEE Aerospace Conference, track Space Missions and Architectures, 1467 . pp. 1-39. [Publication] 
3. Braun, Robert D. and Manning, Robert M. (2006) [Mars exploration entry, descent and landing challenges](#). IEEE Aerospace Conference, N/A . [Publication] 
4. Steltzner, Adam and Desai, Prasun and Lee, Wayne and Bruno, Robin (2003) [The Mars Exploration Rovers Entry, Descent and Landing and the Use of Aerodynamic Decelerators](#). 17th AIAA Aerodynamic Decelerator Systems Technology Conference and Seminar, UNK . [Publication] 
5. Powell, Dick and Lockwood, Mary Kae (2005) [Cassini/Huygens Probe Entry, Descent, and Landing \(EDL\) at Titan: Independent Technical Assessment](#). [Report] 

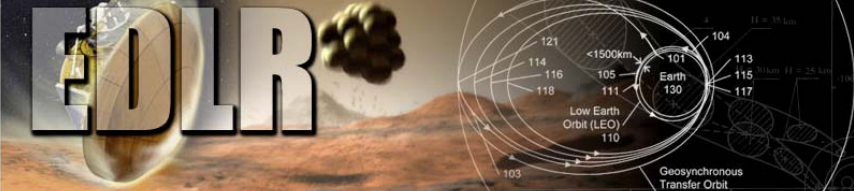
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[Refine search](#) | [New search](#) | [Save search](#)

Order the results: by year (most recent first)

Unique Features

- **Email Notification:** users can save search criteria and configure it to trigger at specified times, and search results will be emailed.
- **Most Wanted List:** a bulletin board for users to post requests for unique and rare material

Most Wanted List



NESC Entry Descent Landing Repository

HOME SEARCH BROWSE HELP CONTACT INFO

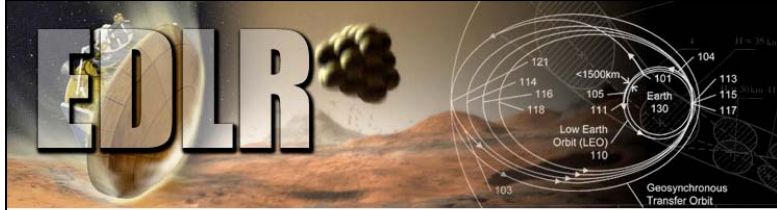
Logged in as admin admin | [Manage deposits](#) | [Profile](#) | [Saved searches](#) | [Review](#) | [Admin](#) | [Logout](#) | Quick Search ?

Manage Most Wanted List

Title of request

Description of request

Date Added	User	Title	Description	Control
2008-06-25	admin	Example most wanted item for IPPW	To demo most wanted list at the IPPW. This item will be deleted soon after the IPPW demo.	Remove



NESC Entry Descent Landing Repository

[Login](#)

Welcome to the EDL Repository

Username:

Password:

[Forgot Your Password?](#) [Request an Account](#) [Contact the Curator](#)

[EDL Release Presentation](#) [EDL Beta Test Instructions](#)

Note: you must have cookies enabled.

Most Wanted Documents

Example most wanted item for IPPW
To demo most wanted list at the IPPW. This item will be deleted soon after the IPPW demo.

Future Capabilities

- Virus Checking
- Batch Submissions
- Improved User Interface

Maintenance & Preservation

- During operations the SA and Curator are responsible for:
 - Maintenance
 - Focuses on periodic upgrades to the software system and hardware as technology improvements are made
 - EPrints, Web server, database
 - Faster machines, storage expansion
 - Preservation
 - Ensures that the stored material can continue to be read as technology changes
 - Migration to newer file formats, transferring data from decaying media, replacing outdated tools with current versions

Questions and Comments

General Info

EDL Repository Location:

<https://edlr.jpl.nasa.gov>

Contact Information:

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