

Advancement of Data Quality within the Adverse Condition Awareness Tool

Adverse Condition (AC)

Circumstance that is a subset of an “Off-Nominal” condition that prevents both the return to nominal operations and mission success unless a technical work-around of the causal fault is devised

Goal

Increase the comprehensiveness and usability of ACAT by expanding the relevancy of its information



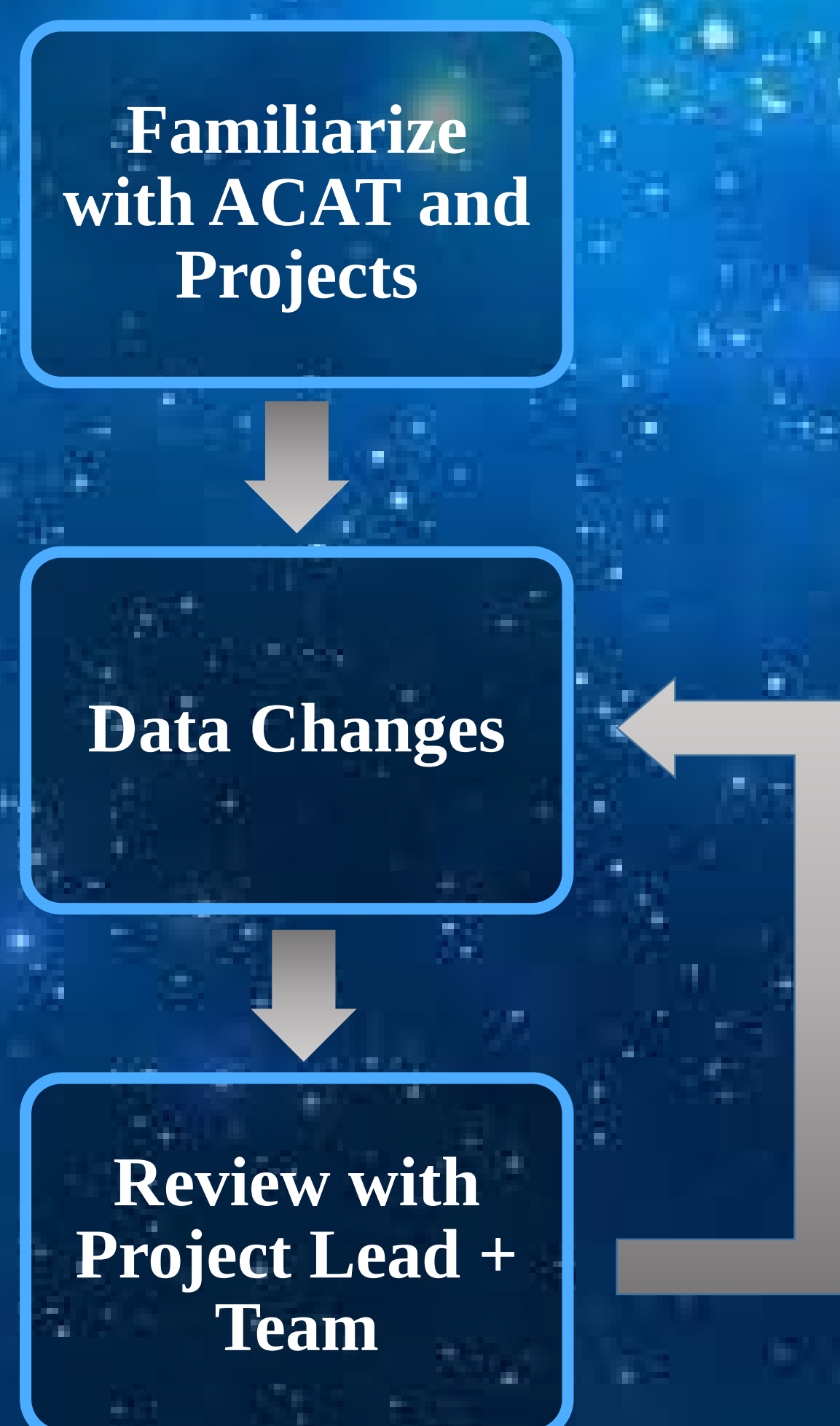
Adverse Condition Awareness Tool (ACAT)

AC Database developed by Software Assurance Research Program Fault Management Architectures Encore (SARP FMAE), implemented by Software Assurance Tools (SWAT) and IT

Benefits of ACAT Usage

- Promotes searchability and discovery of existing ACs across projects through tags and querying
- Enables project team to conveniently reference ACs for analyses, such as Capability Based Analysis (CBA)
- Aids in planning of technical workarounds for ACs
- Allows reference of other fault management documentation and analysis tools, such as Analysis Tool Set (ATS)

Project-Specific Data Changes



JWST

The James Webb Space Telescope will orbit Earth to photograph astronomical objects of interest.

- Meeting with PL led to purging outdated entries that would clear the database for future use.

JPSS1 Flight

The Joint Polar Satellite System, made in collaboration with NOAA, is a polar-orbiting, environmental satellite.

- Tagged domains, failure types, hazard types, and capabilities for searchability and discovery.

JPSS1 Ground

The ground station for all JPSS satellites, located in McMurdo Station, serves as a downlink.

- Tagged for searchability and discovery.
- Meeting with entire team for usage walkthrough led to expressed interest in ACAT's features, such as reporting and exporting data.

JPSS2

This satellite will serve a function complimentary to JPSS1 by collecting atmospheric data in a polar orbit.

- Tagged domains, failure types, hazard types, and capabilities for searchability and discovery.

Landsat 9

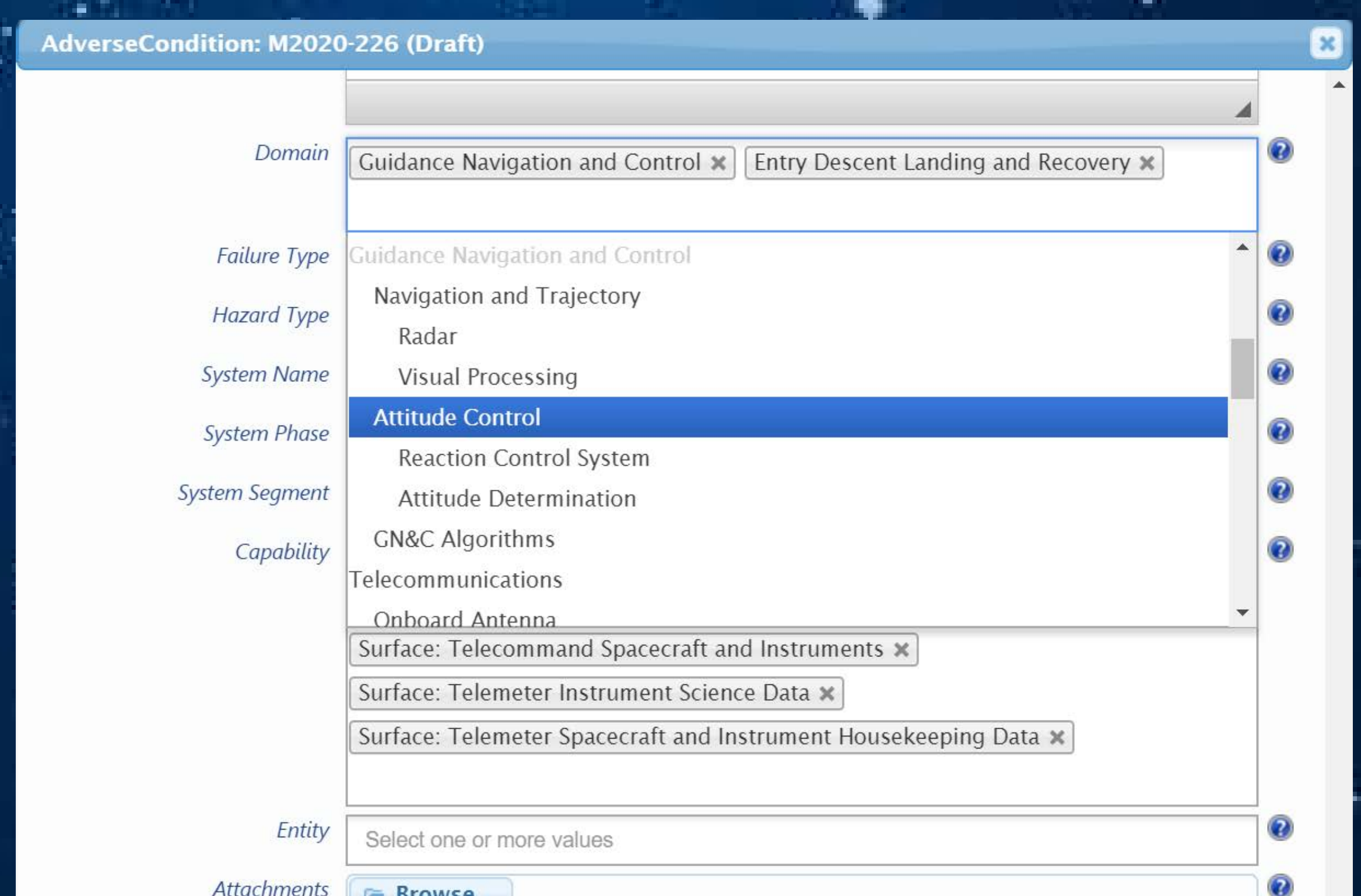
Landsat 9 is a satellite that will observe the Earth's surface to measure both human-induced and natural change on the surface.

- Imported ACs from Portfolio Based Risk Assessment (PBRA) to jumpstart project's ACAT usage.
- Tagged for searchability and discovery.

ICESat2

ICESat2 is a satellite that will orbit the Earth to measure ice sheet elevation and land topography.

- Tagged domains, failure types, hazard types, and capabilities for searchability and discovery.

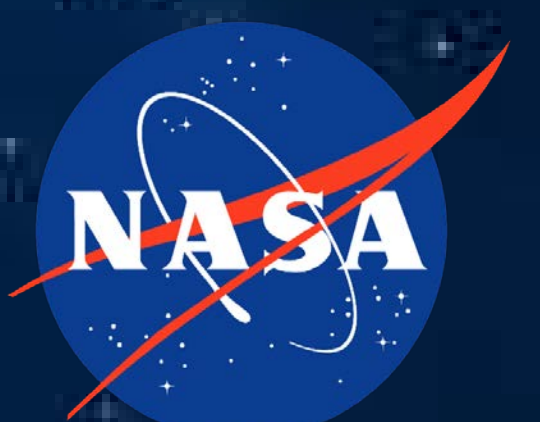


NASA IV&V 2018 Summer Interns

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NASA's
Independent Verification
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Fairmont, WV



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Lucy

Lucy will visit Jupiter’s Trojans to study and collect data that will help increase knowledge of the formation of our solar system.

- Meeting with PL initiated interest for ACAT usage following further project development.

EGS

Exploration Ground System, located at the Kennedy Space Center in Florida, is a facility used to assemble, transport, and launch both rockets and spacecraft.

- Tagged for searchability and discovery.
- Interest propagated for future tool tutorials.

HEO Integration

Human Exploration and Operations Integration combines the efforts of different IV&V HEO projects to provide a common ground for communication.

- Tagged for searchability and discovery.

HEO SLS

The HEO Space Launch System is a powerful rocket that will carry a variety of missions, such as Orion.

- Meeting with PL led to referencing FMEA documentation within ACAT.
- Tagged for searchability and discovery.

SGSS

The Space Network Ground Segment Sustainment project provides ground-based NASA space communication services and activities.

- Meeting with PL initiated interest for ACAT usage.
- Tagged for searchability and discovery.

PSP

The Parker Solar Probe is a spacecraft that will probe the outer corona of the sun to advance understanding of solar wind acceleration.

- Tagged for searchability and discovery.

OSIRIS-REx

The Origins Spectral Interpretation Resource Identification Security – Regolith Explorer is traveling to the near-Earth asteroid Bennu to collect a sample that will help scientists investigate how planets form and life began.

- Tagged for searchability and discovery.

InSight

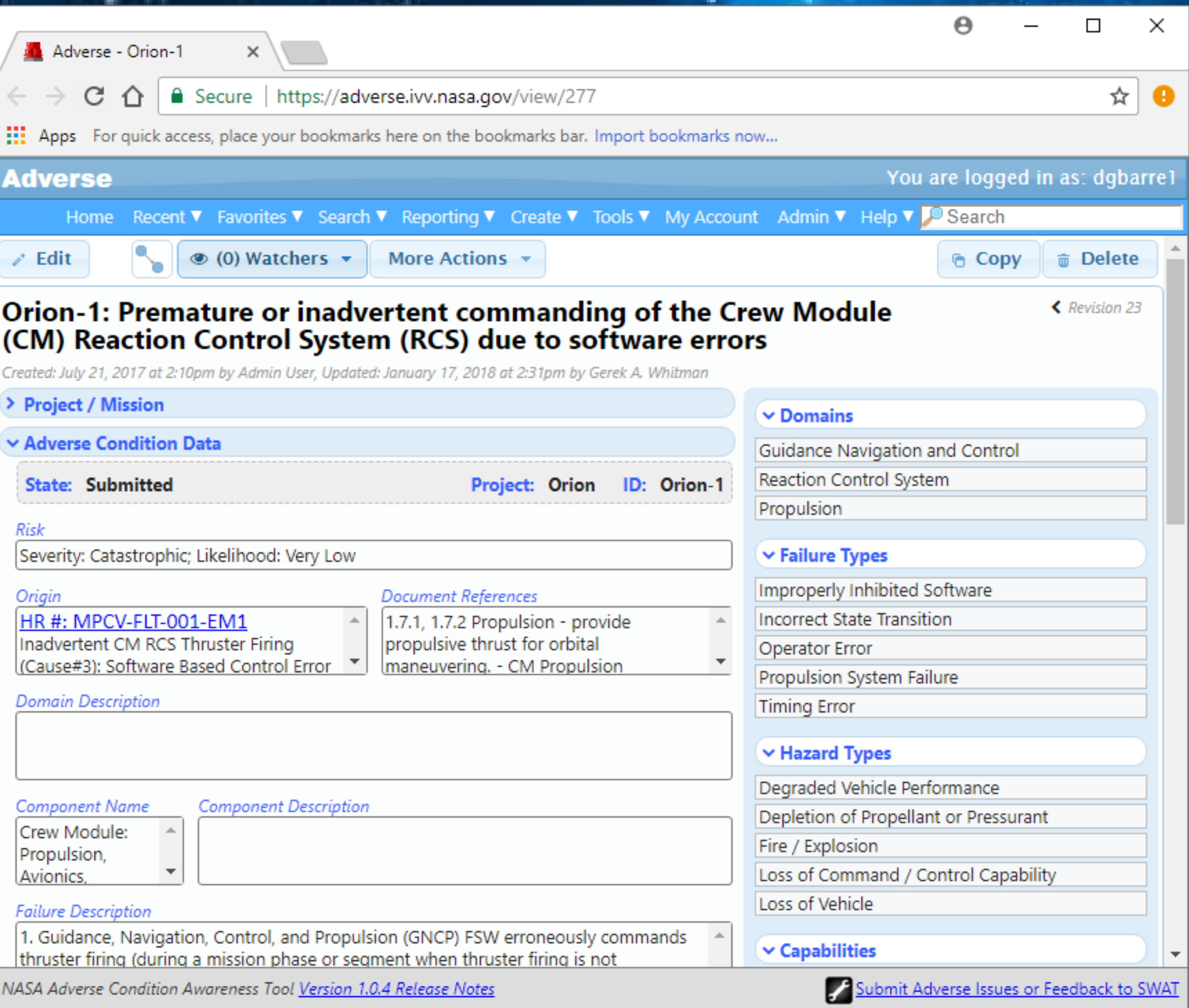
The Interior Exploration using Seismic Investigations Mars lander is the first outer space robotic explorer to study the “inner space” (i.e. crust, mantle, core) of Mars.

- Tagged for searchability and discovery.

Mars 2020

The Mars 2020 rover will probe the Martian rocks for evidence of past life, caching soil and rock samples.

- Parsed existing data into appropriate fields to clean up AC entries.
- Tagged for searchability and discovery.



Outcomes

- Tagged current ACs with domains, failure types, hazard types, and capabilities to categorize them and increase searchability
- Promoted tool changes to augment usability and efficiency
- Parsed existing entries to organize information into appropriate fields
- Convened meetings with project leads and teams to discuss ACAT usage and improvements
- Introduced new projects to using ACAT
- Created additional entries for unlisted ACs

Future Plans

- Enhance data quality of existing entries for later reference
- Encourage further use of ACAT by analysts for current and future projects
- Execute more tool changes to continually improve ACAT

Suggested Tool Changes

- ✓ Reform the capability options to be project-specific
- ✓ Update the Help Button link
- ❑ Fix minor UI bugs
- ❑ Allow editing within the preview window
- ❑ Select upper level domains automatically to standardize tagging protocol

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