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| HERON Software Quality Assurance and Maintenance and Operations Deviations | | | | | | | |

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| HERON Software Quality Assurance and Maintenance Operations Deviations | | |
| PLN-6123 | | |
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# PURPOSE

Software quality assurance (SQA) is a set of activities necessary to provide adequate confidence that a software item or product conforms to the set of functional and technical requirements specified for that item. The Holistic Energy Resource Optimization Network (HERON) Software, as a plugin of the Risk Analysis and Virtual ENvironment (RAVEN) Software, inherits its SQA plan (SQAP) PLN-5552 with some deviations, which are enumerated in this document. Together, these provide a standardized method of capturing software requirements, how those requirements will be implemented, how the software will be tested, how changes to the software will be controlled, and how software deficiencies will be handled. This document establishes the deviations from RAVEN’s specifications covering the periods of software development, maintenance and operations (M&O), and retirement. Together with the RAVEN plan, these plan deviations implement applicable requirements in conformance with PDD-13610, “Software Quality Assurance”.

## RAVEN Description

RAVEN is a flexible and multi-purpose uncertainty quantification (UQ), regression analysis, probabilistic risk assessment (PRA), data analysis and model optimization software. RAVEN was designed and has been developed to provide the capabilities needed to perform:

* Uncertainty Quantification,
* Sensitivity Analysis / Regression Analysis,
* Probabilistic Risk and Reliability Analysis (PRA),
* Data Mining Analysis
* Model Optimization

RAVEN is operational within multiple projects. Ongoing support of RAVEN is required for the purpose of adding functionality, correcting computational errors and improving the performance of the RAVEN software.

* RAVEN is maintained by a team of scientists/researchers, referred to herein as the RAVEN core team (see def.). RAVEN maintenance and operations, performed by the RAVEN core team, is an ongoing activity.
* This plan covers the maintenance of all existing and future components of RAVEN. This includes, but is not limited to, servers, server software, user workstations, RAVEN software, and control documents. Changes to this document will be completed through the Electronic Change Request (eCR) process.

## Software Lifecycle

RAVEN is using an Agile life cycle methodology. The life cycle will be performed in an iterative manner and address the requirements, design, implementation, testing, installation and checkout, operations and maintenance, and retirement phases.

## Assumption and Constraints

* The RAVEN core team will adhere to LWP-1303, “Management of Unclassified Cyber Security Information Systems” and LWP-1401, “Preparing and Releasing Scientific and Technical Information Products,” where applicable.
* 29 USC 794d, Section 508 of the Workforce Investment Act of 1998 considerations will be made for the ability of disabled individuals to access the information or service provided by the software.
* INL will manage the software with support from vendors (for *acquired software* [see def.]) until the software is retired.
* Software vendor support agreements are maintained.
* For firmware, changes to acquired software including software updates and security patches will be implemented by the product vendor.
* The hardware that serves RAVEN is managed by the High-Performance Computing Group. The hardware is considered a configuration item (see def.) for the RAVEN asset, and changes impacting the RAVEN framework must be reviewed by the RAVEN technical lead or designee; however, the management of the hardware is outside the scope of this plan.

## Deviation Policy

All deviations from this plan require management approval. Whether planned or unplanned, if any deviation from this plan is necessary, the following components will be determined:

* Identification of task affected.
* Reasons for deviation defined.
* Effects on the quality of the project.
* Time and resource constraints affected.

A deviation report will be generated, and authorization will be required. Deviations that violate requirements must be documented within the relevant issue.

# REFERENCES

The following source documents apply to this SQAP Deviation Specification:

* PLN-5552, RAVEN and RAVEN Plug-ins Software Quality Assurance And Maintenance And Operations Plan

# DEVIATIONS

This section enumerates deviations from the standards set forth in the RAVEN SQA M&O Plan.

## Code Standards

The HERON software imposes a coding standard on all source code within the repository. This standard is maintained on the HERON GitLab repository wiki website (https://hpcgitlab.hpc.inl.gov/RAVEN\_PLUGINS/heron/-/wikis/Coding-Standards) and enforces through the continuous integration testing system. This deviates from the RAVEN SQA M&O Plan in that the standards are hosted on site within the HERON repository.