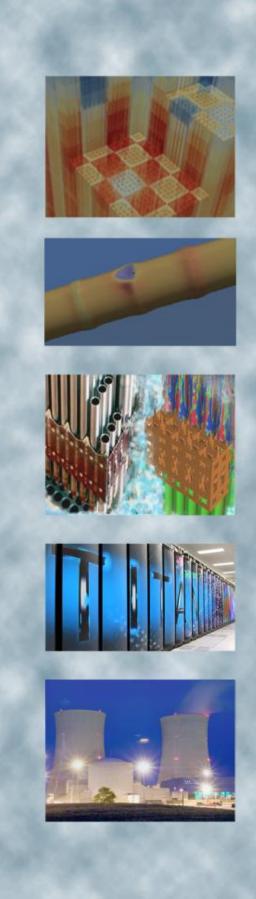




# VERA-CS User Support Activities for PoR 14

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Approved for Public Release







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## **EXECUTIVE SUMMARY**

The purpose of this milestone is to document the user support activities that took place between 10/1/2016 and 3/31/2017 (PoR 14). In the normal PHI workflow, that also extends to several activities within RTM, a Kanban process is followed. This involves creating tickets for specific work items and track the progress to complete these specific work items.

The PHI Kanban is the primary source for the content of this report. The reader should note that there may be items missing from the report. Missing items would not be present for one of the following reasons:

- 1. The work was not documented using a Kanban ticket. Typically this applies to tasks that take less than an hour. Individually this may be a small item, but collectively over the PoR this may combine to non-trivial effort.
- 2. Information in the Kanban ticket was not properly entered. This happens more frequently than we think.

The scope of this report summarizes all activities related to VERA-CS user support activities; where those activities may be providing direct support or indirect support.

Discussion of work related to the following components such: BISON, MAMBA, Tiamat, Cicada, and Shift, and VERAView are not included.

User support activities related to providing installations or releases to users are not discussed in this report. There is a separate milestone (L3:PHI.INF.P14.04) and report documenting these activities over PoR 14.

During PoR 14 there were approximately 108 PHI Kanban tickets related to user support activities, either directly or indirectly. In total there were 108 tickets related to user support activities for VERA-CS. There were 56 new reported defects and 34 defects fixed in PoR 14. 44 tickets were related to miscellaneous user requests and did not directly support any milestones. Work was also performed for 30 tickets related to 7 milestones. A training was also given to WEC.





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## **ACRONYMS**

BWR boiling water reactor

CASL Consortium for Advanced Simulation of Light Water Reactors

CI Continuous Integration
CE Combustion Engineering

CTF COBRA-TF subchannel thermal-hydraulics code

DNB departure from nucleate boiling IFBA Integral Fuel Burnable Absorber

MAMBA MPO advanced model for boron analysis

MPACT Michigan parallel characteristics transport code

MCNP Monte Carlo N-Particle

NaN Not a Number
PHI Physics Integration
PoR plan of record

PWR pressurized water reactor RIA reactivity insertion accident RTM Radiation Transport Methods

UIUC University of Illinois Urbana-Champaign

UM University of Michigan

VERA-CS Virtual Environment for Reactor Applications – Core Simulator

WEC Westinghouse Electric Corporation



## 1. INTRODUCTION

The purpose of this milestone is to document the user support activities that took place between 10/1/2016 and 3/31/2017 (PoR 14). In the normal PHI workflow, that also extends to several activities within RTM, a Kanban process is followed. This involves creating tickets for specific work items and track the progress to complete these specific work items. The format of this documentation is an HTML website that interfaces to an SQL database. This format is very useful for providing access, navigability, and record keeping. However, it is not particularly amenable to providing a coherent, complete, and distributable summary of activities.

CASL does the majority of its work scope definition and planning through milestones. However, there are regular tasks that arise that require individuals' efforts to address that were not necessarily contained within the scope of these milestones. From the software development side this can include fixing code defects, adding simple features to facilitate ease of use or analysis, adding major capabilities that enable new types of analyses, or research into potential methods to improve upon the existing methods. From an infrastructure point of view some of these activities can include deploying installations for individual users on target platforms, updating documentation or preparing a release, or providing user training or answering user questions via email. There is also analysis support to evaluate the accuracy of existing models or data and potentially improving upon these. Collectively, these activities may be thought of as user support activities.

The PHI Kanban is the primary source for the content of this report. The reader should note that there may be items missing from the report. Missing items would not be present for one of the following reasons:

- 1. The work was not documented using a Kanban ticket. Typically this applies to tasks that take less than an hour. Individually this may be a small item, but collectively over the PoR this may combine to non-trivial effort.
- 2. Information in the Kanban ticket was not properly entered. This happens more frequently than we think.

To facilitate comprehension of the remainder of this report, the following subsections provide some definitions and categories that are used throughout this document. The remainder of the document is organizes as follows: Section 2 describes all the defects fixed in PoR 14, Section 3 lists describes or summarizes the new user features added, and Section 4 lists other miscellaneous activities. Sections 5 and 6 list less relevant or indirect user support activities related to research and then anything else.

## 1.1 Definitions

#### **1.1.1 VERA-CS**

For the purposes of this milestone report VERA-CS constitutes the following components:

- COBRA-TF
- MPACT
- ORIGEN
- VERAIn
- Cross section library data for MPACT



Discussion of work related to other components such as: BISON, MAMBA, Tiamat, Cicada, and Shift, and VERAView are not included.

Additionally, user support activities related to providing installations or releases to users are not discussed in this report. There is a separate milestone (L3:PHI.INF.P14.04) and report [1] documenting these activities over PoR 14.

# 1.1.2 User support activity

This term is used in a very broad sense to encompass any activity that is performed to directly or indirectly provide support to a user.

#### **1.1.3 Defect**

A defect constitutes a problem with an existing feature that does not work as intended. These are typically identified by users.

# 1.1.4 Feature

A feature constitutes a capability that was not previously available that is requested by a user or on a users' behalf.

# 1.2 Categories of User Support Activities

# 1.2.1 Direct support

Activities that provide direct support include things like: providing an install for a user on some particular platform, fixing a defect, or adding a feature with a component in the input.

## 1.2.2 Indirect support

Activities that would be examples of indirect support are things like: updating the theory manual or documentation, developing a new algorithm that allows the code to run faster, improving nuclear data, evaluating or assessing the accuracy of an existing model, or adding a more rigorous numerical method.



# 2. DEFECTS

This section summarizes all the defects discovered and fixed during the PoR. Each subsection lists the defects relevant to the components of VERA-CS.

A total of 56 new defects were reported, and a total of 34 defects were resolved.

# **2.1 MPACT**

Table 1 lists all new defects reported for MPACT. There were 37 defects reported. Table 2 lists all defects closed for MPACT. There were 23 defects that were resolved.

Table 1. New defects for MPACT reported in PoR 14

Table 1. New defects for MPACT reported in PoR 14				
PHI Kanban Ticket #	Ticket Description			
4433	(Defect) MPACT segfaults in some cases when using threads with rectangular pin meshes			
4435	(Defect) resonance option for non-resonance isotopes			
4436	(Defect) UIUC core follow transient case is crashing			
4438	(Defect) Problem 9 mini has been failing since 9/26/16			
4511	(Defect) ThermalExpandXML does not expand user axial mesh			
4518	(Defect) NaN error with Power Normalization when using zero Xenon			
4524	(Defect) MPACT testPlanarSynthesis failing on UM CI			
4542	(Defect) Thermal Expansion of Clad Inner Radius is wrong for IFBA			
4557	Fix valgrind defects in MPACT Nodal Sweeper			
4561	(Defect) IFBA rods are not thermally expanded correctly			
4562	(Defect) Thermal expansion code can create different pin pitches in different assembly types			
4563	(Defect) Axial thermal expansion is not production ready			
4564	(Defect) Refined ray spacing for IFBA is limited by memory requirements for 1000 core models			
4565	(Defect) Full symmetry is non-functional for some problems			
4566	(Defect) Isotope edits don't function for spatial decomposition			
4567	(Defect) Isotope edits don't function without depletion			
4570	(Defect) Axial remeshing works but the ends of the fuel stacks cannot be different			
4572	(Defect) MPACT speedups not reliable for reload cycles			
4573	(Defect) Isotope edits for inserts on the line of symmetry are half of the correct value			
4583	(Defect) Non-convergence for mid-Cycle depletion statepoint using Hybrid SP3 method			
4584	(Defect) Error with reduced diameter control rod tips			
4585	(Defect) MAMBA-1D fails when modelling a mid-cycle shutdown with zero power input			
4622	(Defect) Set default shielder ray spacing in future releases			
4668	(Defect) Use of 'mod' as a material name in standard input changes results			
4671	(Defect) Thermal expansion produces error with multiple IFBA materials			
4696	(Defect) op_date in [STATE] block should be unset with depletion			
4697	(Defect) reset_sol can not be used in two consecutive blocks			
4698	(Defect) Assembly Pin Data Pin Power Edits segfault and do not identify correct symmetry for standard input			
4704	(Defect) Available Partition Table in MPACT output does not reflect the options for EXPLICITRADIAL scheme			
4771	(Defect) Resonance data interpolation and B-10 depletion in the simplified AMPX capability			
4776	(Defect) Error reading multiple restart files and silent errors reading restart file			



4791	(Defect) Futility doesn't compile without MPACT
4797	(Defect) Core map in HDF5 output is not correct for 16x16 assembly
4810	(Defect) Issues with parallel VERA-CS transient calculations
4813	(Defect) Isotope merging problem for O-16 in UO2 +Er2O3 for the SAMPX capability
4846	(Defect) Fix assm_map usage for shuffles
4852	(Defect) Wrong answer when setting boron to zero in stacked cases

Table 2. Closed defects for MPACT reported in PoR 14

PHI Kanban Ticket #	Ticket Description	Status/ Resolution
4566	(Defect) Isotope edits don't function for spatial decomposition	fixed
3582	(Defect) Make sure all STATE input variables are updated in each calculation	fixed
4106	(Defect) Pin Exposures Equal to Zero After Restart	fixed
4393	(Defect) Bug in Control Rod Volume Correction	fixed
4433	(Defect) MPACT segfaults in some cases when using threads with rectangular pin meshes	fixed
4435	(Defect) resonance option for non-resonance isotopes	fixed
4436	(Defect) UIUC core follow transient case is crashing	fixed
4438	(Defect) Problem 9 mini has been failing since 9/26/16	fixed
4524	(Defect) MPACT testPlanarSynthesis failing on UM CI	fixed
4565	(Defect) Full symmetry is non-functional for some problems	fixed
4622	(Defect) Set default shielder ray spacing in future releases	fixed
4810	(Defect) Issues with parallel VERA-CS transient calculations	fixed
4813	(Defect) Isotope merging problem for O-16 in UO2 +Er2O3 for the SAMPX capability	fixed
4852	(Defect) Wrong answer when setting boron to zero in stacked cases	fixed
3460	(Defect) Fix P2 scattering error with external coupling	wontfix
4585	(Defect) MAMBA-1D fails when modelling a mid-cycle shutdown with zero power input	wontfix
3840	(Defect) bug in control rod treatment when poison boundary aligns with fuel	in review
4511	(Defect) ThermalExpandXML does not expand user axial mesh	in review
4542	(Defect) Thermal Expansion of Clad Inner Radius is wrong for IFBA	in review
4562	(Defect) Thermal expansion code can create different pin pitches in different assembly types	in review
4671	(Defect) Thermal expansion produces error with multiple IFBA materials	in review
4771	(Defect) Resonance data interpolation and B-10 depletion in the simplified AMPX capability	in review
4776	(Defect) Error reading multiple restart files and silent errors reading restart file	in review

# 2.2 COBRA-TF

Table 3 lists all new defects reported COBRA-TF. There were 17 new defects reported. Table 4 lists all defects closed for COBRA-TF. There were a total of 9 defects resolved.

Table 3. New defects for COBRA-TF reported in PoR 14

PHI Kanban Ticket #	Ticket Description	
4439	(Defect) Test_RodMesh failing in STATIC build	
4442	(Defect) Input for rod radiative heat transfer model does not work	
4457	(Defect) CTF manuals not getting updated on website	
4503	(Defect) Heat balance output file showing wrong power to model	
4509	(Defect) Fix mistake in BFBT C2A model	
4532	(Defect) CTF HDF5 reader no longer works with new version of VERA-CS	



4538	(Defect) Fix VUQCore_CTF_verain_small_singlerod_HFP
4549	(Defect) CTF standalone build tests failing (but not VERA-CS builds)
4552	(Defect) Sort through standalone CTF test failures on Redhat
4554	(Defect) Biasi correlation not consistent with literature
4571	(Defect) Release Candidate 0 is using COBRATF.ini rather than the new CTF preprocessor defaults
4673	(Defect) Issues with multistate diff tool printout
4694	(Defect) xml2ctf doesn't get centroids right for boundary channels with shroud
4754	(Defect) bwr-p6-test doesn't build with xml2ctf anymore
4838	(Defect) linear heat rate does not update every state in CTF HDF5 output
4860	(Defect) VERA-CS crashes when 'parallel' not in COBRA-TF block
4863	(Defect) Fix BFBT P6 series input decks

Table 4. Closed defects for COBRA-TF reported in PoR 14

PHI Kanban Ticket #	Ticket Description	Status/ Resolution
4076	(Defect) Pin steam rate not printed correctly to HDF5 file for symmetry cases	fixed
4125	(Defect) Annular/mist interfacial drag model in CTF is not consistent with theory manual	fixed
4284	(Defect) Interfacial drag/heat transfer not implemented correctly	fixed
4367	(Defect) Specifying zero noncondensable gas void in CTF crashes code	fixed
4407	(Defect) New CTF Preprocessor does not support older cases	fixed
4439	(Defect) Test_RodMesh failing in STATIC build	fixed
4538	(Defect) Fix VUQCore_CTF_verain_small_singlerod_HFP	fixed
4571	(Defect) Release Candidate 0 is using COBRATF.ini rather than the new CTF preprocessor defaults	wontfix
4403	(Defect) BWR preproc uses geometric center instead of centroids	in review

# 2.3 ORIGEN

Table 5 lists all new defects reported for ORIGEN. Table 6 lists all defects closed for ORIGEN. There was a total of 1 new defect reported and one defect resolved.

Table 5. New defects for ORIGEN reported in PoR 14

PHI Kanban Ticket #	Ticket Description
4569	(Defect) Lithium depletion is degraded with 4.2m5 cross section library

Table 6. Closed defects for ORIGEN reported in PoR 14

PHI Kanban Ticket #	Ticket Description	Status/ Resolution
4566	(Defect) Isotope edits don't function for spatial decomposition	in review
4569	(Defect) Lithium depletion is degraded with 4.2m5 cross section library	in review



# 2.4 VERAIn

Table 7 lists all new defects reported VERAIn. Table 8 lists all defects closed for VERAIn. There was a total of 1 new defect reported and one defect closed.

Table 7. New defects for VERAIn reported in PoR 14

PHI Kanban Ticket #	Ticket Description
4672	(Defect) Cannot change the incore detector type through input

Table 8. Closed defects for VERAIn reported in PoR 14

P	HI Kanban Ticket #	Ticket Description	Status/ Resolution
	4672	(Defect) Cannot change the incore detector type through input	wont fix



# 3. ACTIVITIES RELATED TO OTHER MILESTONES

This section summarizes the tickets documenting work related to other milestones. The milestones that received user support during this PoR are given in Table 9.

Table 9. Milestones supported during PoR 14

CASL Milestone	Description
L2:RTM.P14.01	Develop and deliver nuclear cross section data libraries supporting Pressurized Water Reactor (PWR) and Boiling Water Reactor (BWR) designs
L2:RTM.P15.02	Development of transient MPACT-CTF capability for RIA (with DNB)
L3:PHI.VCS.P13.03	Restart file improvements for performance and coupling
L4:PHI.VCS.P14.01	coupled MPACT+CTF for transient analysi
L3:PHI.RIA.P15.01	Initial implementation of transient VERA-CS
L3:AMA.RX.P14.08	Evaluation and Testing of VERA for CE System-80 Design
ACT:PHI.FY17.02	Training

# 3.1 L2:RTM.P14.01

This milestone was about delivering an improved cross section capability for VERA-CS/MPACT. This involved the generation of new cross section libraries, the addition of a capability to read a simplified AMPX library, and substantial evaluation of these new libraries. Improving and delivering the new data is direct user support. The additional features and evaluation is indirect user support. For a complete description of this milestone work please see the milestone report [2]. A list of relevant tickets is provided in the table below.

Table 10. Tickets supporting L2:RTM.P14.01 completed during PoR 14

	Tuble 10. Hences supporting Bentinin 1 not completed during 1 or 1.			
PHI Kanban Ticket #	Description	Status/ Resolution	Support	
4221	Generate 51- and 252-group libraries for MPACT in July 2016	fixed	direct	
4245	Automate the reactivity analysis for MPACT cross section library	fixed	direct	
4380	Improve the ENDF/B-7.0 and 7.1 MPACT 51-g libraries	fixed	direct	
4469	Merge Simplified AMPX to master and assess accuracy	fixed	direct	
4495	Extends the simplified AMPX capability for depletion	fixed	direct	
4678	Print group-wise reaction rate error in text with the reaction rate analysis tool	fixed	direct	
4526	Split natural isotopes for the simplified AMPX capability	in review	direct	
4240	Generate MPACT-MCNP pincell comparisons for depleted cases	fixed	indirect	
4276	Investigate large eigenvalue sensitivities to number of radial rings in fuel	fixed	indirect	
4363	Update MCNP-MPACT pincell comparison report for 51g library	fixed	indirect	
4364	Update MCNP-MPACT assembly comparison report for 51g library	fixed	indirect	
4452	Evaluate mpact51g_v4.2m2 library	fixed	indirect	
4461	Evaluate memory and computing time requirements for new AMPX library	fixed	indirect	
4492	Evaluate mpact51g_v4.2m4 library	fixed	indirect	
4743	BWR benchmark calculations by using the SAMPX 51 & 252-g libraries	fixed	indirect	
4392	Generate isotopic analysis comparisons with data and SCALE codes	in review	indirect	
4577	Run DIMPLE Criticals with mpact51g_70_v4.2m3_10272016_sph.fmt	in review	indirect	



## 3.2 L2:RTM.P15.02

This milestone is about providing an upgraded transient capability. Some initial effort was provided to support this milestone. The full extent of the efforts related to this milestone will be documented in the future milestone report. The list of relevant tickets are given in the table below.

Table 11. Tickets supporting L2:RTM.P15.02 completed during PoR 14

PHI Kanban Ticket #	Description	Status/ Resolution	Support
4812	Implement MPACT edits for transient calculations	in progress	direct
4493	Improve and Document Transient Input Cards	closed	direct
	Enable exponential transformation	closed	direct

# 3.3 L3:PHI.VCS.P13.03

This milestone was about delivering improved features to the restart capability. The full description of this work can be found in the milestone report [3]. This work constitutes direct user support. The relevant tickets completed during PoR 14 are given in the table below.

Table 12. Tickets supporting L3:PHI.VCS.P13.03 completed during PoR 14

PHI Kanban Ticket #	Description	Status/ Resolution	Support
3575	Add axial re-mesh option during core shuffle	fixed	direct
3736	Add MAMBA scratch arrays to restart file	in review	direct
4211	Write all STATE values to the HDF output file and restart file	fixed	direct
4314	Read all STATE values from the restart file to the state type	fixed	direct

# 3.4 L4:PHI.VCS.P14.01

This work was primarily research, but some of the efforts here were leveraged for the L3:PHI.RIA.P15.01 milestone. See the section on the L3:PHI.RIA.P15.01 milestone for more detail.

#### 3.5 L3:PHI.RIA.P15.01

This milestone was about providing an initial capability to run VERA-CS (e.g. MPACT and CTF coupled) for transients. For a complete description of this work see the milestone report [4]. The list of tickets relevant to this milestone are given in the table below.

Table 13. Tickets supporting L3:PHI.RIA.P15.01 completed during PoR 14

PHI Kanban Ticket #	Description	Status/ Resolution	Support
4256	Merge MPACT Transient branch into master	closed	direct
4628	Implement basic coupled transient capability in CTF	closed	direct
4640	Modify MPACT to handle transient coupled with CTF	closed	direct

#### 3.6 L3:AMA.RX.P14.08

This milestone was about extending the capability of VERA-CS to combustion engineering designs. During this work, several issues were identified and addressed. This constitutes direct user support. Further information about this milestone can be found in the milestone report [5]. The list of tickets supporting this milestone are given in the table below.



Table 14. Tickets supporting L3:AMA.RX.P14.08 completed during PoR 14

 II Kanban Ticket #	Description	Status/ Resolution	Support
4735	Add coupling support between MPACT/CTF for CE-16 models	in review	direct
4477	Allow "large4" control rods for CE-16x16 lattices	fixed	direct
4517	Generate the v4.2m5 MPCT 51-g libraries including Er-162, 164 and 170	fixed	direct

# 3.7 ACT:PHI.FY17.02

This is a PHI milestone about administering training. The relevant training activities from PoR 14 included a training provided by Scott Palmtag to engineers from WEC.



# 4. MISCELLANEOUS USER SUPPORT ACTIVITIES

The following table lists all other tickets that do not fit in any of the above categories.

Table 15. Miscellaneous support activities completed during PoR 14

Ticket # Description Resolution  3445 Add ability to input material mixtures by atom density fixed direct  3473 Run case with thermal expansion and quantify effects on ITC fixed indirect  3594 Add CTF preprocessor support for unique instrument tubes fixed direct  3693 Add CTF preprocessor support for unique instrument tubes fixed direct  3674 Add ability to model in-core detectors for Watts Bar Unit 2 fixed direct  4090 Add capability to compute water + soluble boron by two methods fixed direct  4158 Improve Full Core Partition Performance in MPACT wontfix indirect  4159 Design Control Rod Depletion in MPACT fixed indirect  4169 Design and Prototype Fortran Interfaces for Main Trilinos Solvers fixed indirect  4189 Add support for vanadium, response and vanadium, mesh in review direct  4180 Make quarter rotational symmetry model for parallel 4x option in CTF fixed direct  4193 Add support for vanadium, response and vanadium, mesh in review direct  4206 Move MPACT-specific input files from VERAIn repo to MPACT repo fixed indirect  4207 Implement Embedded Pin Cell Solver(s) for Partially Inserted Rods fixed indirect  4226 Add grid effects on TKE for CTFAMBAB amiluations fixed direct  4227 Add comparison to BFBT axial void measurements invalid indirect  4228 Consolidate Logic for Executing Subgroup  4280 Evaluate what needs to be done to turn on dynamic gap conductance from VERAIn fixed indirect  4320 Fix axial mesh tolerance in MPACT & CTF  4321 BWR Control Blade Movement Implementation fixed direct  4335 Under MPACT Fast Flux to HDF5 File  4346 Implement shuffle map label format input option  4357 Update Theory Manual To Include Chapter for 1D-Axial Nodal Kernels  4368 Make CTF assure uniform axial power if no power profile given fixed indirect  4378 Implement VERA input for MOX  4379 Implement VERA input for MOX  4370 Update Theory Manual on Include T-group Subgroup  5xed indirect  4475 Add capability to produce normalized MPACT FSR mesh output fixed direct  4475 Add Support to CRReader for chan.out files with n	PHI Kanban	nban Status/			
3473 Run case with thermal expansion and quantify effects on ITC in review direct 3594 Add Warning messages to MPACT in review direct 3693 Add CTF preprocessor support for unique instrument tubes fixed direct 3693 Integrate Burnup-dependent Fuel Conductivity in CTF fixed direct 3674 Add ability to model in-core detectors for Watts Bar Unit 2 fixed direct 4090 Add capability to compute water + soluble boron by two methods fixed direct 4158 Improve Full Core Partition Performance in MPACT wonfits indirect 4159 Design Control Rod Depletion in MPACT fixed indirect 4159 Design and Prototype Fortran Interfaces for Main Trillinos Solvers fixed indirect 4169 Design and Prototype Fortran Interfaces for Main Trillinos Solvers fixed indirect 4189 Make quarter rotational symmetry model for parallel 4x option in CTF fixed indirect 4189 Add support for vanadium_response and vanadium_mesh in review direct 4206 Move MPACT-specific input files from VERAIn repo to MPACT repo fixed indirect 4206 Implement Embedded Pin Cell Solver(s) for Partially Inserted Rods fixed indirect 4206 Add grid effects on TKE for CTF/MAMBA simulations fixed direct 4257 Add comparison to BFBT axial void measurements invalid indirect 4261 Consolidate Logic for Executing Subgroup fixed Virtual Add Fixed indirect 4262 Evaluate what needs to be done to turn on dynamic gap conductance from VERAIn fixed indirect 4305 Write MPACT Fast Flux to HDF5 File fixed direct 4301 BWR Control Blade Movement Implementation fixed direct 4318 BWR Control Blade Movement Implementation fixed direct 4321 BWR Control Blade Movement Implementation fixed direct 4336 Make CTF assume uniform axial power if no power profile given fixed indirect 4368 Make CTF assume uniform axial power from power profile given fixed indirect 4378 Inplement Service on the PACT Fixed Profile Fixed direct 4476 Add capability to produce normalized MPACT FSR mesh output in review direct 4476 Add Capability to produce normalized MPACT FSR mesh output in review direct 4476 Add Carbact fixed power for hone o		Description		Support	
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	4794	Enhance the HELIOS library processing for the upcoming HELIOS-2 library	in review	direct	



4855	Add defaults for xlabel/ylabel	fixed	direct
4871	Write utility to detect feedback for use in scripts	in review	direct

# 5. CONCLUSIONS

During PoR 14 there were approximately 108 PHI Kanban tickets related to user support activities, either directly or indirectly. In total there were 108 tickets related to user support activities for VERA-CS. There were 56 new reported defects and 34 defects fixed in PoR 14. 44 tickets were related to miscellaneous user requests and did not directly support any milestones. Work was also performed for 30 tickets related to 7 milestones. A training was also given to WEC.



# REFERENCES

- [1] "L3 PHI.INF.P14.04 Completion Memo," CASL Memo, CASL-U-2017-1304-000, March (2017).
- [2] K. S. Kim, et al., "Development of the V4.2m5 and V5.0m0 Multigroup Cross Section Libraries for MPACT for PWR and BWR," CASL Technical Report, CASL-U-2017-1280-000, Feb. (2017).
- [3] B. Kochunas, D. Jabaay, and R. Salko, "Restart File Improvements for MPACT," CASL Technical Report, CASL-U-2016-1120-000, Jan. (2017).
- [4] A. Wysocki, et al., "Initial Implementation of Transient for VERA-CS," CASL Technical Report, CASL-U-2017-1303-000, March (2017).
- [5] Scott Palmtag, "Evaluation and Testing of VERA for CE System-80 Design," CASL Technical Report, CASL-U-2017-1300-000, March (2017).