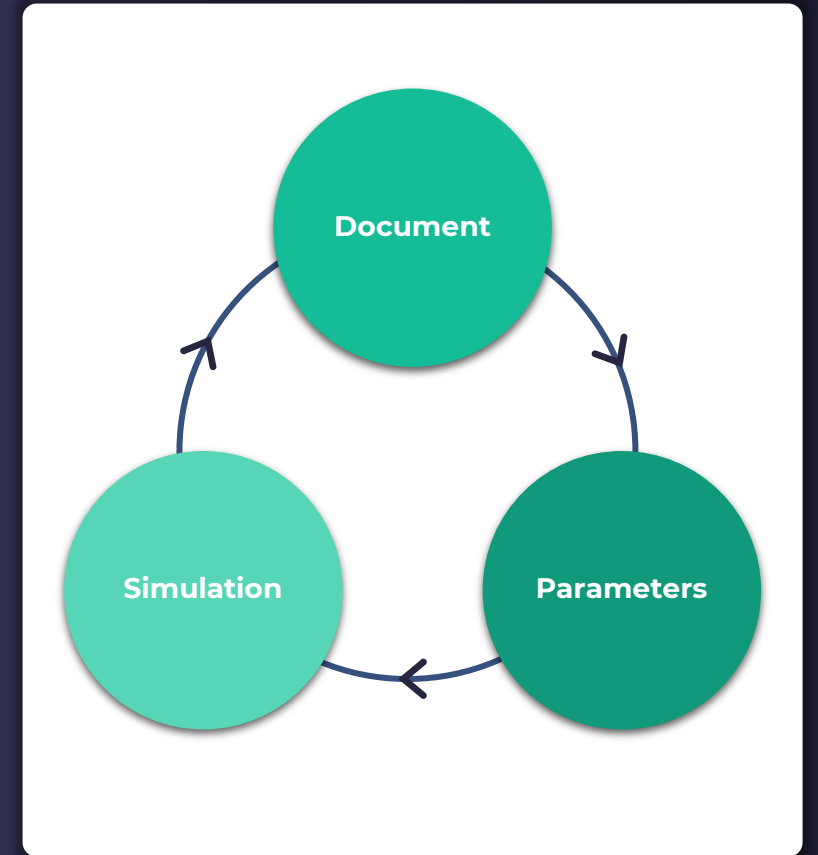
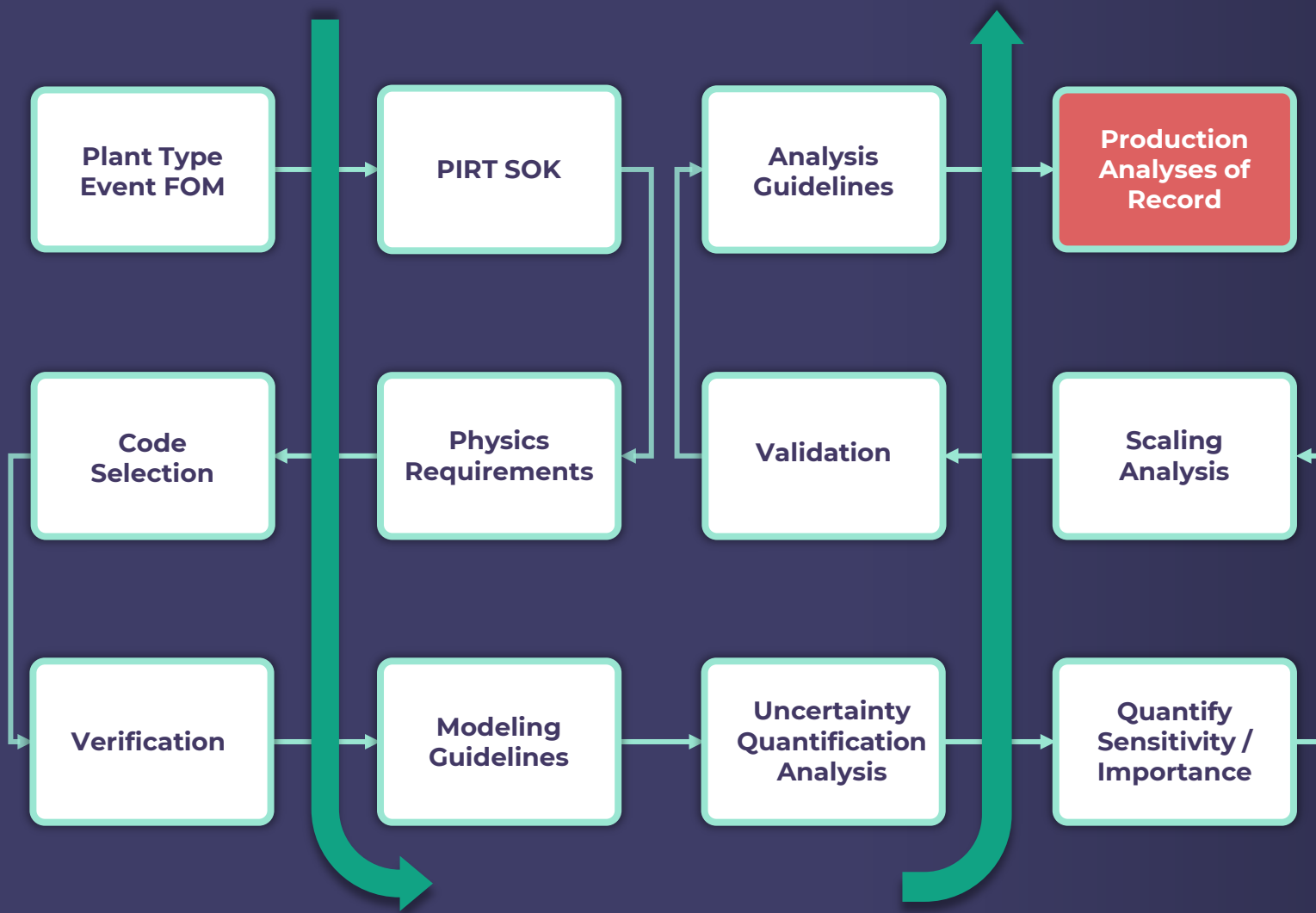


The Digital Implementation of the Evaluation Model Development and Assessment Process or EMDAP (USNRC Regulatory Guide 1.203)

Chris Gosdin
FPoliSolutions, LLC

International RELAP5 Users Group Meeting (IRUG)
July 30, 2025 | Idaho Falls, ID

EMDAP WORKFLOWS



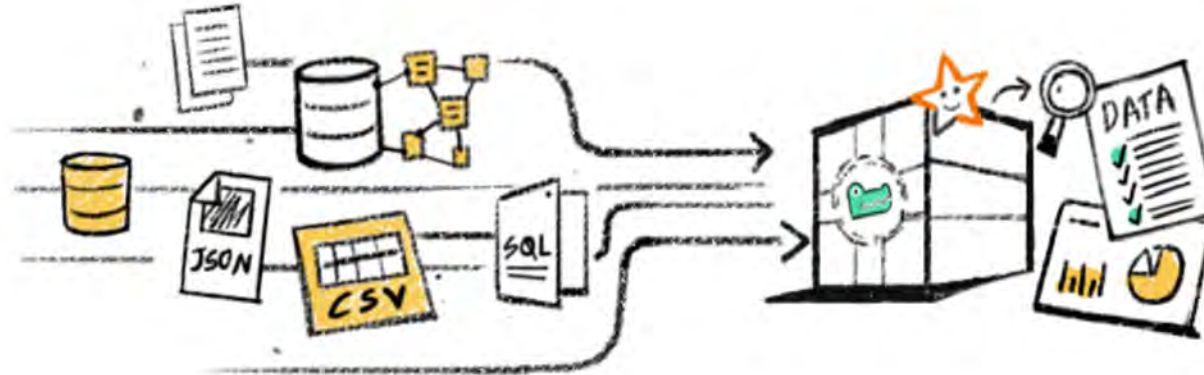
THE DATA WAREHOUSING PROBLEM

1. Legacy experimental comes often in variety of format and media (disparate data sources).

2. More important, the same effort is repeated over and over by the different institutions.

3. Once data is gathered from original sources a significant effort is devoted in qualifying the data, organizing the data for the specific application/project.

4. Most of current database are not easily searchable/scrutable.



5. EMDAP and in general licensing applications is all about QA: traceability and transparency.
Ease of use: Desire to have a more direct link from data to modeling and simulation.

A Modern Infrastructure for Nuclear Analysis



OGMA is a **collaborative digital platform** that links engineering simulations, test data collection from disparate sources, data analytics, and documentation artifacts at enterprise scale. The suite enables organizations to maximize the value of their technical data while promoting engineering process efficiency and ensuring data traceability and integrity.



- This software suite consists of four modules. The first, **OGMA-Docs**, is a lightweight, and highly-scalable document management solution with stringent quality control attributes based on NQA-1. Other FPoliAAP applications share a database with this module, allowing for documents to be relationally linked with simulations and test data.
- The second module, **OGMA-Tests**, helps to access to accurate and reliable test data is essential for engineering organizations, utilities, universities, and government agencies. It serves as a centralized and secure single source of truth in which test records can be stored, maintained, qualified, viewed and accessed. This module unifies disparate data sources including numerical data files, reports, and drawings.
- The third module, **OGMA-Sims**, provides a browser-based web UI to manage simulations frameworks, with generic compatibility and support for nuclear engineering tools. A high degree of automation and organizational collaboration, allowing users to submit simulations from a laptop, tablet, or mobile device, receive notifications when complete, and share results, plots, and other visualizations with collaborators.
- The fourth module, **OGMA-Calcs**, is a powerful analysis and notebook management system that bridges experimental data and simulation results. It enables users to create, organize, and execute custom Jupyter-style notebooks directly linked to test cases and simulations. OGMA-Calcs supports a full range of pre-processing (e.g., boundary condition definition, geometry validation, data transformation) and post-processing (e.g., data qualification, plotting, residual analysis) tasks. All calculations are fully traceable and reproducible, making this module essential for generating regulatory-quality outputs, model documentation, and data analysis reports.

OGMA-Docs GOALS

1. Establish document types (reports, drawings, references) and their project roles

2. Tag documents with metadata to support traceability (e.g., test facility, simulation, system region)

3. Link documentation to test programs, components, and simulation inputs

4. Manage version control, approvals, and archival.

5. Enable search, discovery, and full audit trail of technical decisions



FPoliAAP
By FPoliSolutions, LLC.

OGMA-Projects

OGMA-Docs

Documents (All)

My Documents

Letter Reports (LTR)

Calculation Notes (CN)

Reference Data Sets (RDS)

Technical Reports (FPS)

External References

Policies/Procedures

Time Records

Financial Reports (FIN)

Invoices

NPP License Documents

Drawings

Templates

OGMA-Docs Administration

OGMA-Tests

OGMA-Sim

OGMA-Docs

Import CSV

Export CSV

Import JSON

Export JSON

Import with Files

Document ID	Document Title	Revision	Document Type
RDS-FPS-18-01	Reference Data Set Report for Upper Plenum Test Facility (UPTF) Tes...	0	Reference Data Set (RDS)
RDS-FPS-18-01	Test Report for UPTF Test 6	1	Reference Data Set (RDS)
RDS-FPS-22-01	Reference Data Set Report for Two-Phase Test facility (TPTF) Program	0	Reference Data Set (RDS)
RDS-FPS-22-01	Reference Data Set Report for Two-Phase Test facility (TPTF) Program	1	Reference Data Set (RDS)
RDS-FPS-22-01	Reference Data Set Report for Two-Phase Test facility (TPTF) Program	2	Reference Data Set (RDS)
RDS-FPS-22-01	Reference Data Set Report for Two-Phase Test facility (TPTF) Program	3	Reference Data Set (RDS)
RDS-FPS-23-01	Reference Data Set (RDS) for the UPTF TRAM A5 Test Program	0	Reference Data Set (RDS)
RDS-FPS-24-01	Reference Data Set (RDS) for the IVO Loop Seal Clearing (LSC) Test P...	0	Reference Data Set (RDS)
RDS-FPS-24-01	Reference Data Set (RDS) for the IVO Loop Seal Clearing (LSC) Test P...	1	Reference Data Set (RDS)
RDS-FPS-24-02	Test Report for TPTF Tank Level Studies	0	Reference Data Set (RDS)
RDS-FPS-24-03	Test Report for TPTF Pressure Studies	0	Reference Data Set (RDS)
RDS-FPS-XX-XXX	Test Report for UPTF Test 6 Demo	0	Reference Data Set (RDS)

Search Docum

Search Document Title

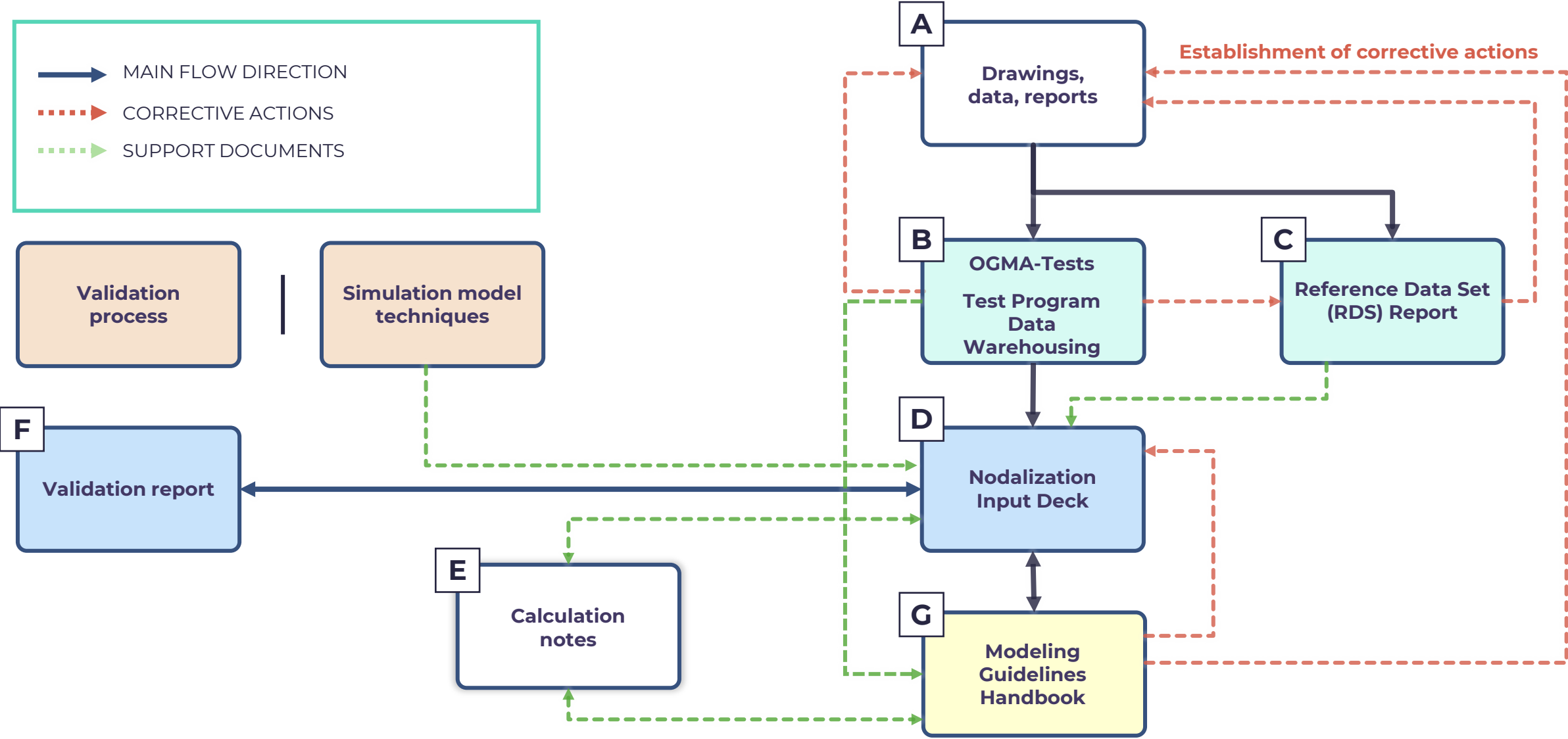
Search

Search Document Typi

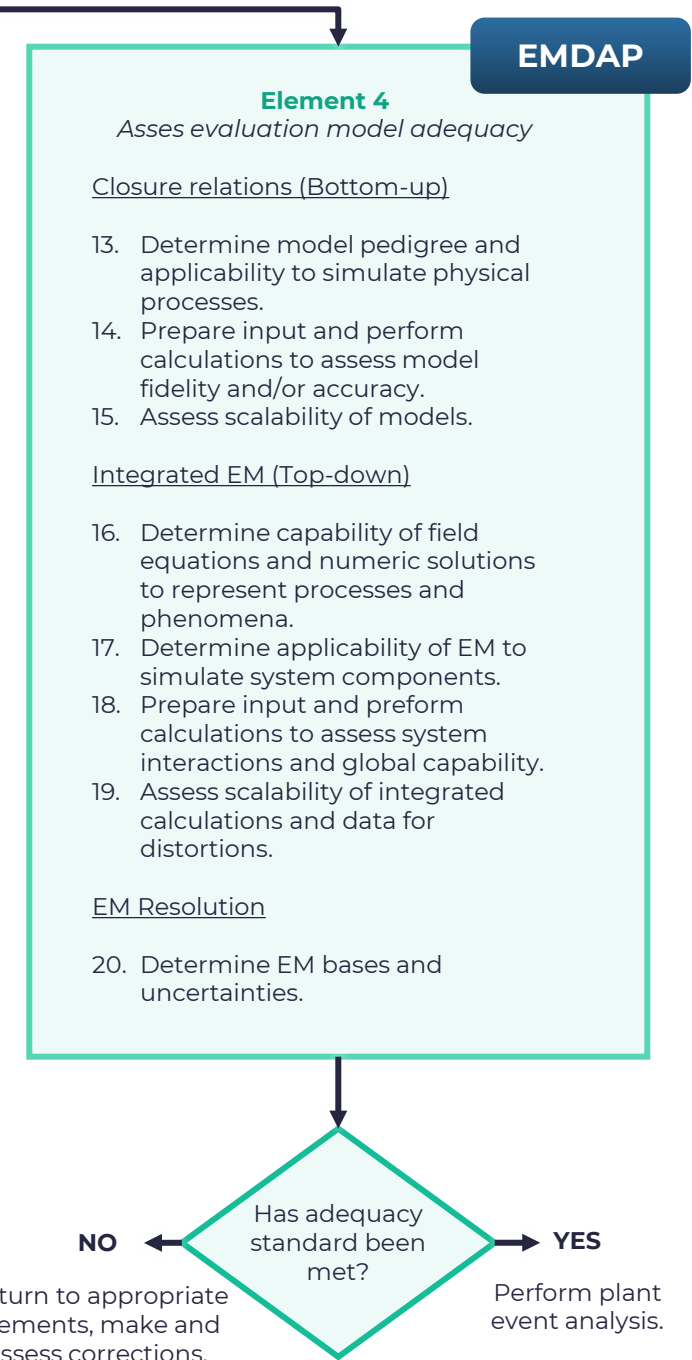
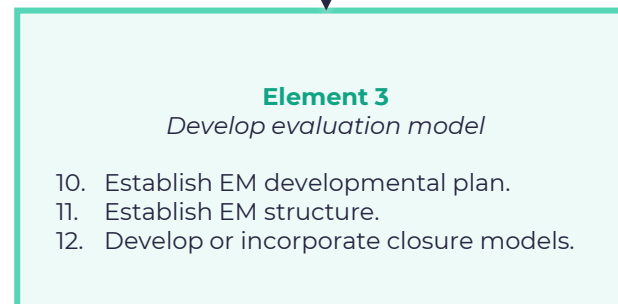
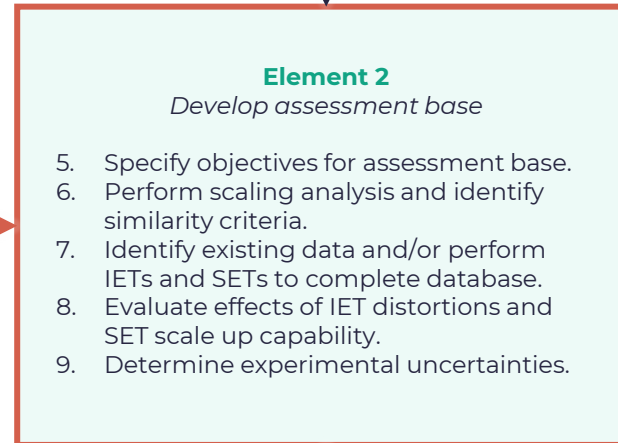
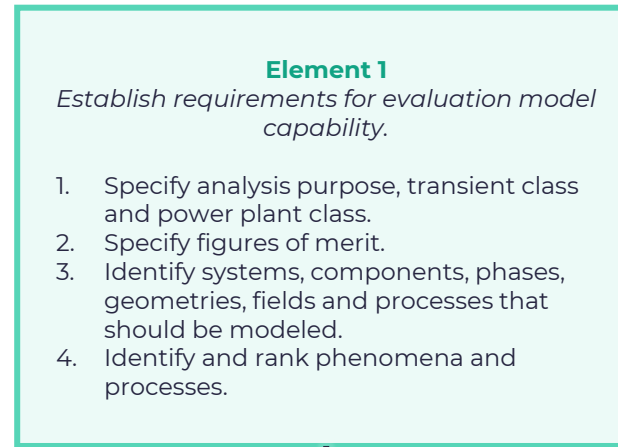
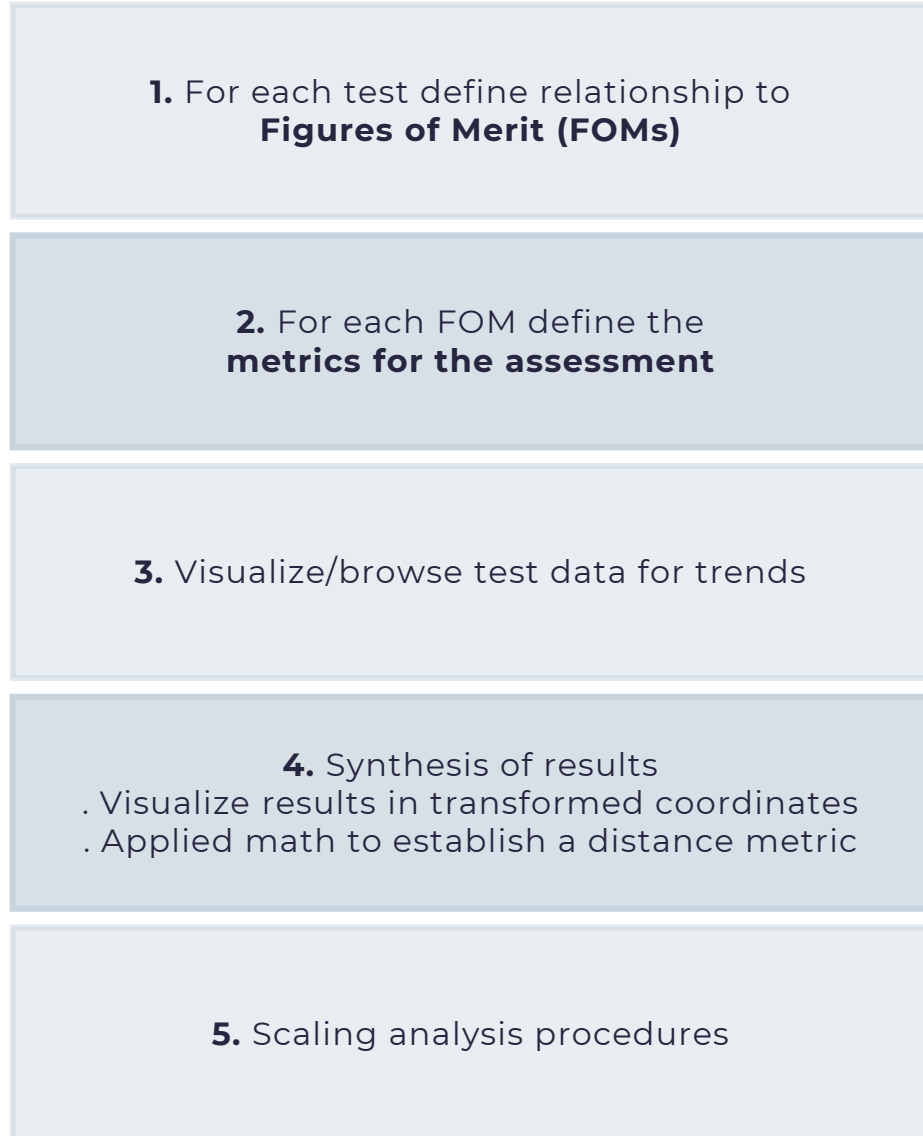
Showing 1 to 12 of 12 entries

Refresh Table

OGMA-Test : Creation of Reference Data Set (RDS)



OGMA-Tests GOALS



OGMA-Tests Facility Overview

At a Glance

Country

Germany

Organization

Siemens AG UB KWU

Operation Start

1986

Operation End

1994 (2D/3D)

Domain

Thermal-Hydraulic

Reference System Design

PWR

Number of Hot Legs

4

Number of Cold Legs

4

Facility Type

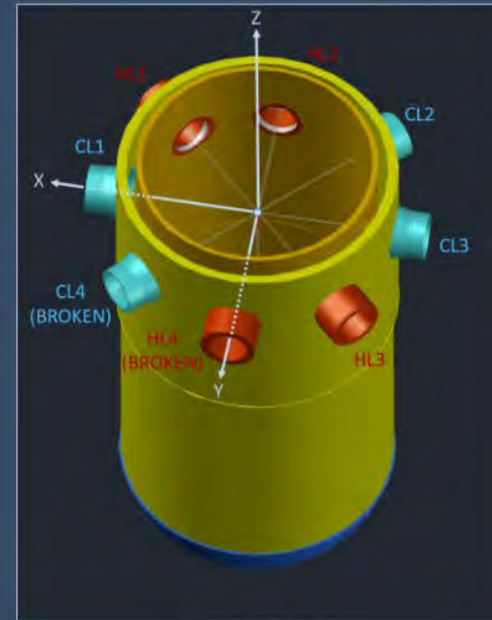
SET

Scaling Considerations

Full-Scale representation of German 4-Loop PWR (Convoy). The UPTF is a full-scale simulated PWR that was constructed and operated by SIEMENS/KWU and provided experimental data of the three-dimensional, thermal-hydraulic, steam/water behavior in the upper plenum, loops and downcomer. The test facility is located in Mannheim, Germany and it is adjacent to the coal-fired power plant Grosskraftwerk Mannheim. This power plant served as steam supply for the experiments

Images

 Upload New Image



OGMA-Tests Facility Overview

Details

Description

Testing Summary

References

Upper Plenum Test Facility. UPTF is a 1:1 scale model of a four-loop 1300MWe Siemens/KWU pressurized water reactor. This model includes a reactor vessel, downcomer, lower plenum, core simulation, upper plenum, and four loops with pump and steam generator simulation. Upper plenum internals, downcomer, and primary coolant piping were replicas of the reference four-loop 1300MWe water reactor.

The core, coolant pumps, steam generators and containment were replaced with thermal-hydraulic behavior simulators. This allowed for simulation of thermal-hydraulic behavior during the end-of-blowdown, refill, and reflood phases of a large break LOCA. Three of the loops are intact and one loop is broken (Loop 4). The intact loops are equipped with valves that simulate the reactor coolant pumps, and steam/water separators that simulate steam generators.

The Upper Plenum Test Facility is the German contribution to the 2D/3D project that has been developed within an international agreement between the Germany, Japan, and the United States. The project was developed to experimentally and analytically investigate the multi-dimensional flow behavior in the primary coolant system of a pressurized water reactor during a loss-of-coolant accident.

Programs

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table:

Show 50 entries

Program Name	Status	DBID	DBRV
UPTF Test 21	DRAFT	41	3
UPTF Test 25	DRAFT	44	5
UPTF Test 6	DRAFT	30	194

Statu

ID

Revis

Showing 1 to 3 of 3 entries

Previous

1

Next

Refresh Table

OGMA-Tests Programs Overview

OGMA

Workflow Progress Tracker

Refresh

Add New Test Facility

Archive Test Case

Add New Test Program

Generate RDS Report

Add New Test Case

Approve Test Program

Upload and Configure Test Case Data

OGMA-Tests Program Page

UPTF Test 6



At a Glance

Description

Test 06 simulates a large cold leg break in order to study the countercurrent flow limitation in downcomer, and to establishing a downcomer flooding curve for emergency core coolant. Test 06 includes five test cases, Runs 131, 132, 133, 135 and 136, all designed to study counter current flow in the DC at different boundary conditions. Steam flow was injected into the core simulator and into the steam generator simulators of the intact loops while injecting ECC fluid into cold legs 1-3. The open break in the cold leg of loop 4 allowed steam to pass through the downcomer in an upward direction from the lower plenum to the inlet of the broken leg. Note that the databank file for Run 133 was not available.

Data Availability

The Upper Plenum Test Facility was a joint project between the United States, Germany, and Japan as part of the 2D/3D Test Program. Information in this report is protected by a non-disclosure agreement with the NRC and full access to the data herein requires a similar NDA between the recipient and the NRC. 2D/3D PROGRAM test data and data reports contained within this RDS should not be directly or indirectly disclosed or transmitted or transferred to a third party.

Images

Upload New Image

Primary Dimensions of the UPTF Vessel and Unbroken Loop

OGMA-Tests Programs Overview

Details

Summary	Goals	Geometry Modules	Instrumentation	Constants			
Import CSV	Export CSV	Import JSON	Export JSON	Search in Table:			Show 50 entries
Test Facility	Test Program	Module ID	Module Number	Module Name	Status	DBID	DBRV
UPTF	UPTF Test 6	UPTF-000	300	General Reactor Vessel	DRAFT	40	12
UPTF	UPTF Test 6	UPTF-001	201	Cold Leg Horizontal Pipe	DRAFT	26	2
UPTF	UPTF Test 6	UPTF-002	202	Reactor Coolant Pump	DRAFT	21	3
UPTF	UPTF Test 6	UPTF-003	203	Cold Leg Vertical Pipe	DRAFT	29	4
UPTF	UPTF Test 6	UPTF-004	204	Cold Leg Horizontal Pipe	DRAFT	14	2
UPTF	UPTF Test 6	UPTF-005	205	Cold Leg Vertical Pipe	DRAFT	16	2
UPTF	UPTF Test 6	UPTF-006	206	Cold Leg Pipe Elbow	DRAFT	2	2
UPTF	UPTF Test 6	UPTF-007	207	Cold Leg Horizontal Pipe	DRAFT	12	2
UPTF	UPTF Test 6	UPTF-008	208	Cold Leg Pipe Elbow	DRAFT	27	2
UPTF	UPTF Test 6	UPTF-009	209	Hot Leg Horizontal Pipe	DRAFT	15	2
UPTF	UPTF Test 6	UPTF-010	210	Hot Leg Steam Generator Inlet Pipe Bend	DRAFT	17	2
UPTF	UPTF Test 6	UPTF-011	301	Lower Plenum	DRAFT	19	3
UPTF	UPTF Test 6	UPTF-012	302	Core Inlet Region	DRAFT	22	2
UPTF	UPTF Test 6	UPTF-013	303	Core Simulator	DRAFT	6	6
UPTF	UPTF Test 6	UPTF-014	304	Fuel Assembly Simulator	DRAFT	8	2
UPTF	UPTF Test 6	UPTF-015	305	Lower Downcomer	DRAFT	11	16
UPTF	UPTF Test 6	UPTF-016	306	Upper Core Plate Region	DRAFT	13	2
UPTF	UPTF Test 6	UPTF-017	307	Upper Downcomer	DRAFT	7	14

OGMA-Tests Programs Overview

Details

Summary
Go

Import CSV

Test Facility

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

UPTF

Geometry Modules Metadata

View Mode

Test Facility

UPTF

Test Program

UPTF Test 6

Module ID

UPTF-001

Module Number

201

Module Name

Cold Log Horizontal Pipe

Module Materials

Add item

Description

Write a short description of the function behind this module

Parameters

×

Parameter Name

Di

Parameter Quantity

length

View Module

Expand Left Panel

Close

Test Facility	Test Program	Module ID	Module Number	Module Name	Module Materials	Description	Parameters
UPTF Test 6	UPTF-017	307	Upper Downcomer	DRAFT	7	14	

OGMA-Tests Programs Overview

Test Cases

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table:

Show 50 entries

Test Case	Test Data Uploaded?	Status	DBID	DBRV
Run 131	Test06-Run131.bin	DRAFT	2	9
Run 132	Test06-Run132.bin	DRAFT	3	8
Run 135	Test06-Run135.bin	DRAFT	27	12
Run 136	Test06-Run136.bin	DRAFT	5	10

Statu

ID

Revis

Showing 1 to 4 of 4 entries

Refresh Table

Previous1Next

Notebooks

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table:

Show 50 entries

Calculation Name	Calculation Type	Status	DBID	DBRV
UPTF Test 6 Geometry	Test Facility Geometry	DRAFT	65	243
UPTF Test 6 Hydraulics Characterization	Test Facility Hydraulics	DRAFT	66	42

Statu

ID

Revis

Showing 1 to 2 of 2 entries

Refresh Table

Previous1Next

Test Report Generator

Current Report: RDS-FPS-18-01, Revision 1

OGMA-Tests Test Case Overview

AP
1s, LLC.

Global Search

Dashboard

Account

OGMA

Workflow Progress Tracker

Refresh

Add New Test Facility

Add New Test Program

Add New Test Case

Upload and Configure Test Case Data

Archive Test Case

Generate RDS Report

Approve Test Program

OGMA-Tests Test Case Page

Run 131



Details

Description

Goals

Run 131 is one case of Test 6 program with a unique total steam injection rate, pressure and injection subcooling. The total ECC injection flow rate is nearly identical among the five test cases

Conditions

Initial Conditions

Boundary Conditions

Chronology Events

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table: Show

50

 entries

Event Name	Event Description
ECC-water entering downcomer	ECC-water entering downcomer. Relative Time related to start of ECC injection.
ECC-water from cold leg 1 starting bypass out the broken cold leg	ECC-water from cold leg 1 starting bypass out the broken cold leg. Relative Time related to start of ECC injection.

OGMA-Tests Test Case Overview

Test Data

Upload A Raw Data File

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table:

Show 50 entries

Test Facility	Test Program	Test Case	Raw File Name	File Md5sum	File Revision	Status	DBID	DBRV
UPTF	UPTF Test 6	Run 131	Test06-Run131.bin	a4aa23fb7002befa673799e1dbf5e	1	PRE	7	12

Search Test Facility

Search Test Program

Search Test Case

Search Raw File Name

Search File Md5sum

Search File Revision

Statu

ID

Revis

Showing 1 to 1 of 1 entries

Previous

1

Next

Refresh Table

Test Case Constants

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table:

Show 50 entries

Test Facility	Test Program	Test Case	Constant	Value	Unit	Status	DBID	DBRV
UPTF	UPTF Test 6	Run 131	Evaluation Time Period (Beginning)	59.5	s	DRAFT	1467	2
UPTF	UPTF Test 6	Run 131	Evaluation Time Period (Ending)	70.5	s	DRAFT	1468	2
UPTF	UPTF Test 6	Run 131	Start of ECC Injection	12	s	DRAFT	1487	2
UPTF	UPTF Test 6	Run 131	Start of Steam Injection	32.5	s	DRAFT	1479	2
UPTF	UPTF Test 6	Run 131	Subcooling of ECC	59	K	DRAFT	1491	2
UPTF	UPTF Test 6	Run 131	Total ECC Injection Rate	1451	kg/s	DRAFT	1483	3

OGMA-Tests Test Case Overview

Test Data

Upload A Raw Data File

Import CSV

Export CSV

Import

Test Facility

Test Program

UPTF

UPTF Test 6

Search Test Facility

Search Test Program

Showing 1 to 1 of 1 entries

Refresh Table

Test Facility

Test Program

UPTF

UPTF Test 6

UPTF

UPTF Test 6

UPTF

UPTF Test 6

UPTF

UPTF Test 6

Import CSV

Export CSV

Import

Test Facility

Test Program

UPTF

UPTF Test 6

UPTF

UPTF Test 6

UPTF

UPTF Test 6

UPTF

UPTF Test 6

Run 131

Start of ECC Injection

12

s

DRAFT

1487

2

Run 131

Start of Steam Injection

32.5

s

DRAFT

1479

2

Run 131

Subcooling of ECC

59

K

DRAFT

1491

2

Run 131

Total ECC Injection Rate

1451

kg/s

DRAFT

1483

3

Data Viewer

+

 Undefined

+

 Other

-

 DC

+

 Well Temperature

+

 Fluid Temperature

-

 Differential Pressure

1A30P023:029

1A30P043:049

1A30P063:069

1A30P123:129

1A0622P043

1A0622P063

1A30P103:109

1A0622P083

1A0622P123

1A30P083:089

1A30P163:169

1A30P183:189

+

 Water Level

HDFS Viewer

30

20

10

0

-10

kPa

0

50

100

150

Time

Reset Graph

Display Timenoties

Attribute

Value

name

1A30P083:089

units

kPa

program_name

UPTF Test 6

facility_name

UPTF

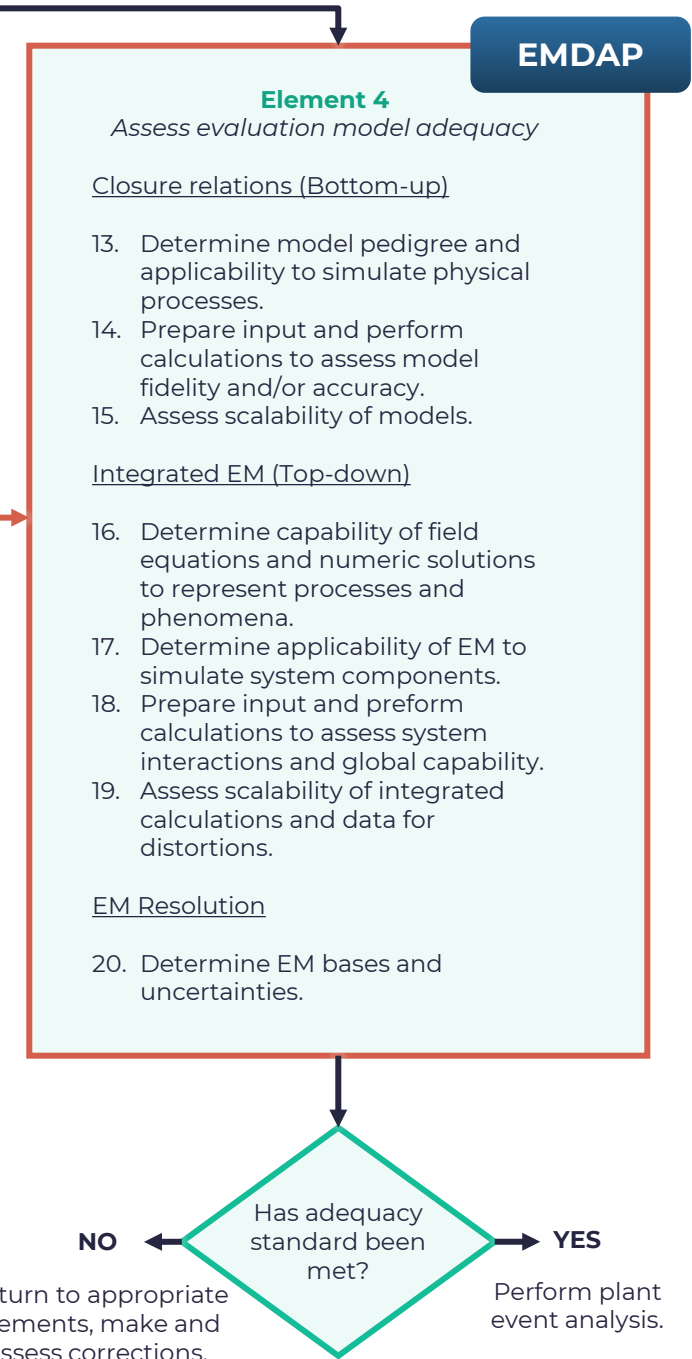
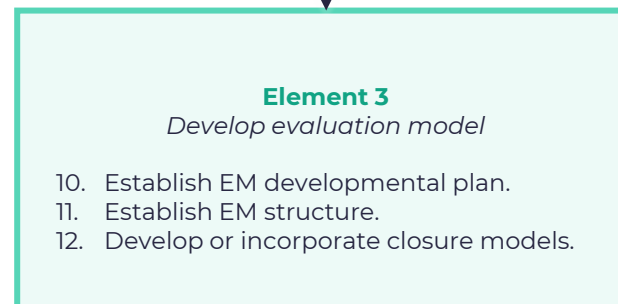
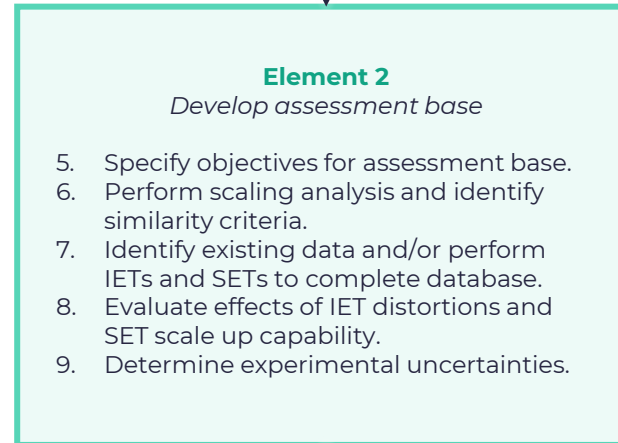
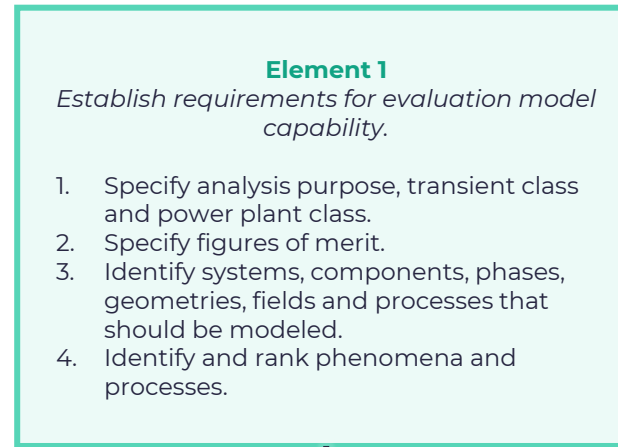
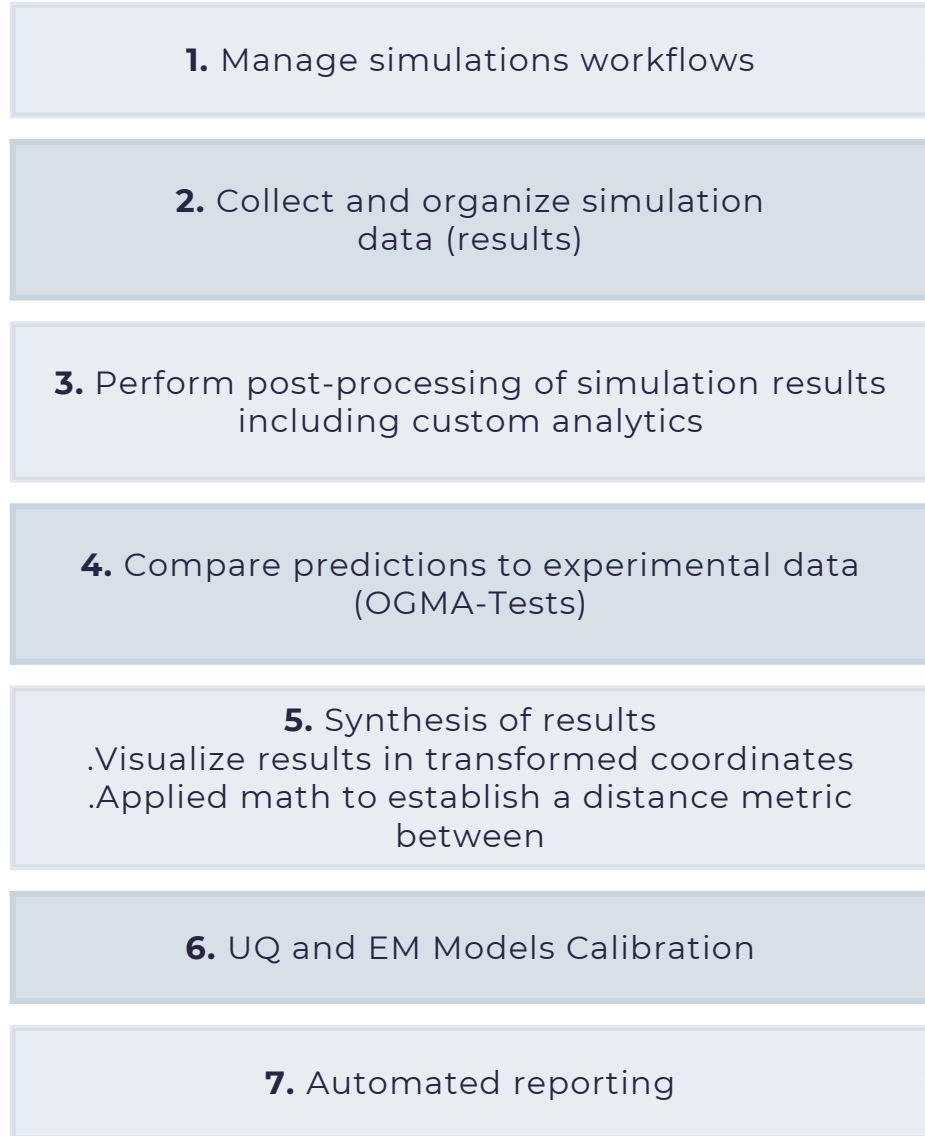
descriptive_name

Differential Pressure

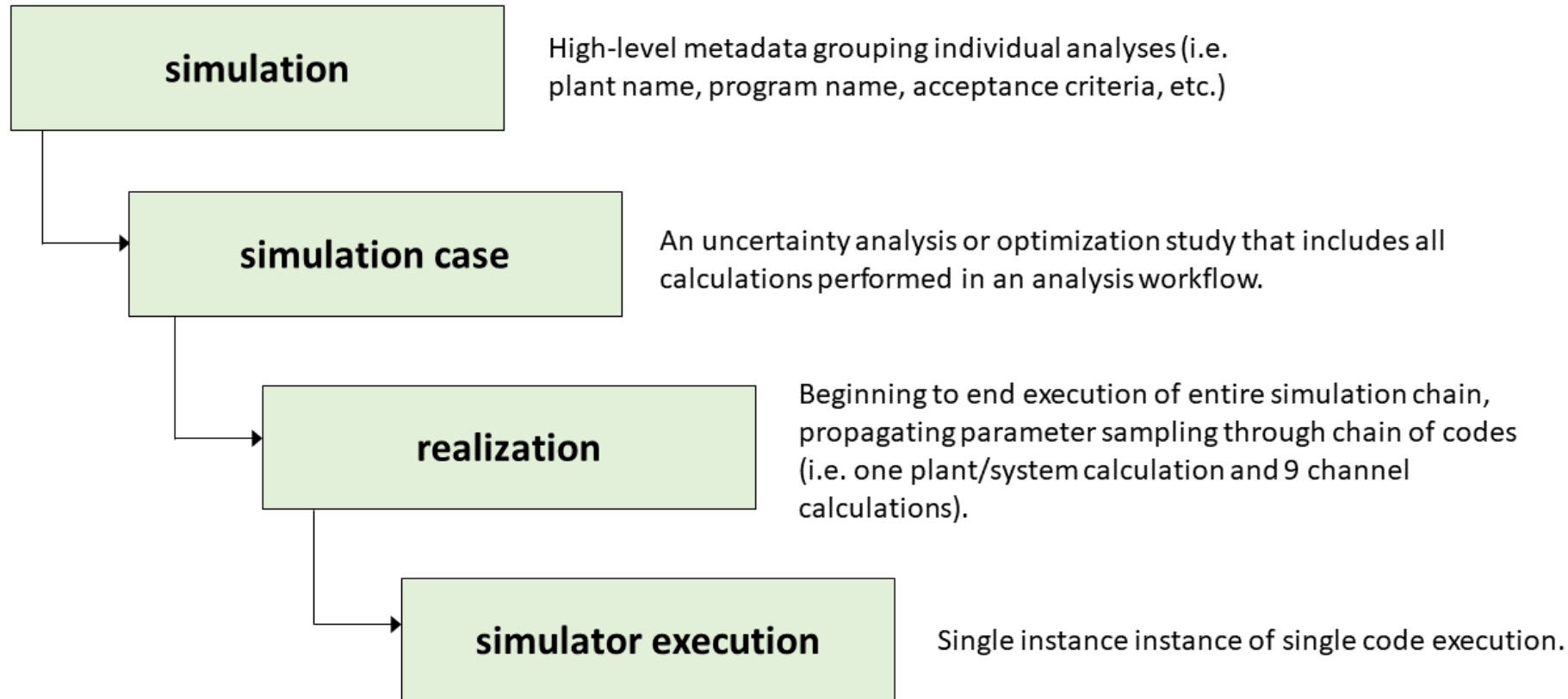
measurement_type

Direct

OGMA-Sims GOALS



OGMA-Sims Overview



OGMA-Sims Inputs

Simulators Metadata

Edit Mode

Simulator Name:

RELAP5-3D

Simulator Description:

System Analysis T/H Code

Simulator Domain:

System Response

Simulator Sub-Type:

Relap5

Validate

Save

Save & Close

Close

OGMA-Sims Inputs

Simulator Versions Metadata

Edit Mode

Simulator Name

RELAP5-3D

Simulator Version Number

V4.4.2

Simulator Location

/usr/local/tools/RELAP53D_COMM/4.4.2/SLE12/relap/relap5.x

Version Attributes

RELAP5-3D Commercial LICENSE

Simulator Supporting Files

Filename

rellic.bin

Installed Location

/usr/local/tools/RELAP53D_COMM/4.4.2/SLE12/relap/

Description

OGMA-Sims Inputs

Simulators Meta

Edit Mode

Simulator Name:
RELAP5-3D

Simulator Description:
System Analysis T/H Code

Simulator Domain:
System Response

Simulator Sub-Type:
Relap5

Simulator Versions Metadata

Edit Mode

Simulator Name:
RELAP5-3D

Simulator Version:
V4.4.2

Simulator Location:
/usr/local/t...

Version Attribute:
RELAP5-3D C...

Simulator Support:
Simulator Sup...

Filename:
rellic.bin

Installed Lo...:
/usr/local

Description:

Simulator Input Decks Metadata

Edit Mode

Input Deck Name:
JPTFJ

Simulator Name:
RELAP5-3D

Simulator Version:
V4.4.2

Simulation Step:
Steady-State

Input Deck md5sum:

Input Deck Description:

Command Line Argument List:
Add item

Input Variables:

Validate Save Save & Close Close

OGMA-Sims Inputs

Simulators Metadata

Edit Mode

Simulator Name:

RELAP5-3D

Simulator Version Number:

V4.4.2

Simulator Description:

System Analysis T/H Code

Simulator Domain:

/usr/local/tools/RELAP53D_COMM/4.4.2

System Response:

V4.4.2

Simulator Sub-Type:

Relap5

Simulation Step:

Steady State

Simulator Supporting Files:

Input Deck md5sum

Filename:

rellic.bin

Installed Location:

/usr/local/tools/RELAP53D_COMM/

Description:

Command Line Arguments

Add item

Input Variables:

Simulator Versions Metadata

Edit Mode

Simulator Name:

RELAP5-3D

Input Deck Name:

RELAP5-3D

Input Deck Description:

Simulator Input Decks Metadata

Edit Mode

Input Name:

cltemp

Quantity:

temperature

Input Units:

Deg-F

Default Value:

556.2

Input Description:

Cold leg temp.

Input Locations for Direct Substitution:

20543000:3,1081202:3,1100200:3,1121201:3,1130200:3,1141201:3,1150200:3,1161201:3,1320201:3,1340

OGMA-Sims Inputs

Simulators Metadata

Simulator Versions Metadata

Simulator Input Decks Metadata

Simulator Name:

RELAP5-3D

RELAP5-3D

Simulator Description:

System Analysis T/H Code

Simulator Domain:

System Response:

Simulator Sub-Type:

Relap5

Simulator Version Number:

V4.4.2

Simulator Location:

/usr/local/tools/RELAP53D_COMM/4.4.2/SLE12/relap/relap5.x

Version Attributes:

RELAP5-3D Commercial LICENSE

Simulator Supporting Files:

Input Deck md5sum:

Filename:

rellic.bin

Installed Location:

/usr/local/tools/RELAP53D_COMM/4.4.2/SLE12/relap/

Description:

Command Line Argument List:

Add item

Input Variables:

20543000:3,10

Input Deck Name:

Input Name:

cltemp

Quantity:

temperature

Input Units:

Deg-F

Default Value:

556.2

Input Description:

Cold leg temp

Input Locations:

20543000:3,10

Output Variables:

Output Name:

Core Pressure Drop

Quantity:

pressure

Output Units:

psi

Output Description:

Output Variable:

cntrlvar_105

Output Name:

Lower Plenum Liquid Level

Quantity:

length

Output Units:

m

OGMA-Sims Inputs

Simulators Metadata

Simulator Versions Metadata

Simulator Input Decks Metadata

Simulator Input Decks Metadata

Simulator Input Decks Metadata

Simulator Name: RELAP5-3D

Simulator Version Number: V4.4.2

Simulator Description: System Analysis T/H Code

Simulator Domain: /usr/local/tools/RELAP53D_COMM/4.4.2/SLE12/relap/relap5.x

Simulator Sub-Type: Relap5

Filename: rellic.bin

Installed Location: /usr/local/tools/RELAP53D_COMM/4.4.2/SLE12/relap/

Description: Command Line Argument List

Input Variables:

Input Deck Name:

Input Name: cltemp

Quantity: temperature

Input Units: Deg-F

Default Value: 556.2

Input Description: Cold leg temp

Input Locations for Direct Substitution: 20543000:3,1081202:3,1100200:3,1121

Output Variables:

Core Pressure

pressure

psi

Output Description: cntrlvar_105

Output Name: Lower Plenum

Quantity: length

Output Units:

Custom Expressions for RELAP5

This option list contains custom expressions to calculate new values for RELAP5 input cards.

Custom Expressions for RELAP5

Variable Name List:

Variable Name(s): rcsmflo

Add item

Operator Expression: %card%*0+rcsmflo*4

Target Location List:

RELAP Input Card(s): 5021201:1,5022201:1,5042201:1,5043201:1,5211301:1,5221201:1,5233201:1,5411301:1,5440201:2,5

Add item

Perform operation on each target location: False

Variable Name List:

OGMA-Sims Simulations



Simulation Manager

Simulations Table

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table:

Show 50 entries

Simulation ID	Simulation Description	RAVEN Templating Module	Associated Plants	Status
☐ DBA15A	DEMO Plant - Main Steamline Break Hot Zero...		Demo_Plant	PRELIMINARY
☐ DBA15B	DEMO Plant - Main Steamline Break Hot Zero...		Demo_Plant	PRELIMINARY
☒ DBA15C	DEMO Plant - Main Steamline Break Hot Full ...		Demo_Plant	PRELIMINARY
DBA15	Search Simulation Description	Search RAVEN Templating Module	Search Associated Plants	Status

Showing 1 to 3 of 3 entries (filtered from 69 total entries)

Previous

1

Next

Refresh Table

Show Simulation Cases

Select a Simulation from the above table, and then click the **Show Simulation Cases** button to display all test Simulation Cases associated with the selected Simulation.

Simulation Cases

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table:

Show 50 entries

Simulation ID	Simulation Case	List of Input Decks	Run Status	Run ID	Run Start Date	Status	DBID	DBRV
DBA15C	RISA SLB HFP	RISA_ss_MultiD.I,RISA_tr_MultiD_slb_ht...	NOT STARTED	N/A	N/A	PRE	345	10
Search Simulation ID	Search Simulation Case	Search List of Input Decks	Search Run Status	Search Run ID	Search Run Start Date	Status	ID	Revi:

Showing 1 to 1 of 1 entries

Previous

1

Next

Refresh Table

OGMA-Sims Simulations

Simulations Metadata

View Mode

Simulation ID:¹

DBA13C

Simulation Description:¹

DEMO Plant - Main Steamline Break Hot Full Power, Power Offsite Power Available

Chapter 15 Accident Analysis
Section 15.15
1. Increase in heat removal by the secondary system

Simulation Template Name:¹

RISA Ensemble Model SLB HFP

Event Acceptance Criteria:

Peak Clad Temperature

Facility Name:

Program Name:

Test Case Name:

Plant Name:¹

Demo_Plant

Plant Class:

PWR

Associated Event Sequence Family:¹

DBE or DBAT:

Associated EMERALD Analysis:¹

Close

OGMA-Sims Simulations

Simulations Metadata

View Mode

Simulation ID:

DBA13C

Simulation Description:

DEMO Plant - Main Steamline Break Hot Full Power

Simulation Template Name:

RISA Ensemble Model SLB HFP

Event Acceptance Criteria:

Peak Clad Temperature

Facility Name:

Program Name:

Test Case Name:

Plant Name:

Demo_Plant

Plant Class:

PWR

Associated Event Sequence Family:

DBE or DBAT:

Associated EMERALD Analysis:

Simulation Cases Metadata

Edit Mode

Simulation Case Name:

RISA SLB HFP

Simulation ID:

DBA13C

Simulation Template Name:

RISA Ensemble Model SLB HFP

Simulation Case Revision:

0

Reference Plant:

Demo_Plant

Case Description:

Case Output Folder:

2023-01-10-000000-000000-000000

Simulation Steps:

Step Name:

RELAPs

Simulator:

RELAPs-3D

Simulator Input Deck:

RISA_SLB_HFP.in

Simulator Version:

V4.4.2

Sampler:

Sampler Type:

Validate

Save

Save & Close

Close

OGMA-Sims Simulations

Simulations Metadata

View Mode

Simulation ID:

DBA13C

Simulation Description:

DEMO Plant - Main Steamline Break Hot Full Power, Power Offsite Power Available

Chapter 15 Accident Analysis

Section 15.1.5

1. Increase in heat removal by the secondary system

Simulation Template Name:

RISA Ensemble Model SLB HFP

Event Acceptance Criteria:

Peak Clad Temperature

Facility Name:

Program Name:

Test Case Name:

Plant Name:

Demo_Plant

Plant Class:

PWR

Associated Event Sequence Family:

DBE or DBA7:

Associated EMRALD Analysis:

Simulation Cases Metadata

Edit Mode

Simulation Case Name:

RISA SLB HFP

Simulation ID:

DBA13C

Simulation Template Name:

RISA Ensemble Model SLB HFP

Simulation Case Revision:

0

Reference Plant:

Demo_Plant

Case Description:

Case Output Midsum:

2025-01-17 10:00:00 to 2025-01-17 10:00:00

Simulation Steps:

✖

Step Name:

2228Pcs

Simulator:

SS36Pcs-05

Simulator Input Deck:

SLB_HFP_MonoD

Simulator Version:

V4.42

Sampler:

✖

Sampler Type:

Simulation Cases Metadata

Edit Mode

Sampler Type:

MonteCarlo

Number of Samples:

20

Seed value:

1232345

Sampler Variables:

✖

Variable:

eccj1

Distribution Type:

Normal

Mean Value:

1

Standard Deviation Value:

0.1

Upper Bound Value:

This is the upper bound value

Lower Bound Value:

This is the lower bound value

Reference Plant Parameter:

Validate

OGMA-Sims Simulations

FPoliAAP
By FPoliSolutions, LLC.
Powered by INL RAVEN and EMRALD

OGMA-Docs

OGMA-Tests

OGMA-Sim

OGMA-Calcs

OGMA-Projects

RISE

EMRALD

TRIBOS

Glossary of Terms

Report an Issue

HDF5 Viewer

Hide Sidebar

Global Search

Dashboard

Account

OGMA-Sim

Simulation Dashboard

Simulation: LOFT2-5_RELAP_COBRA_Test

Simulation Case: RELAP_ss_tr_COBRA_center_edge_pp

380 History Result Sets

191 Scalar Result Sets

Chart Creator

Metric Category

Vector

Scalar

Step Name

COBRA_Center

Distribution

CoreInPress

Execution

Select All

COBRA_Center++51

COBRA_Center++38

COBRA_Center++16

COBRA_Center++5

COBRA_Center++28

COBRA_Center++68

COBRA_Center++36

Configure

Show Legend

Show X Axis Label

Show Y Axis Label

Generate Chart

Results

Search in Table:

Show

entries

	Realization Prefix	Unique Run Identifier	Status	DBID	DBRV
COBRA_Center	COBRA_Center++1	1679520036141	PRE	45	1
COBRA_Center	COBRA_Center++10	1679520036141	PRE	81	1
COBRA_Center	COBRA_Center++100	1679520036141	PRE	389	1
COBRA_Center	COBRA_Center++11	1679520036141	PRE	85	1

OGMA-Sims Simulations



FPoliAAP

By FPoliSolutions, LLC.

Powered by INL RAVEN and EMERALD

OGMA-Docs

OGMA-Tests

OGMA-Sim

OGMA-Calcs

OGMA-Projects

RISE

EMERALD

TRIBOS

Glossary of Terms

Report an Issue

HDFS Viewer

Hide Sidebar

Global Search

Dashboard

Account

OGMA-Sim

Simulation Dashboard

Simulation: LOFT2-5_RELAP_COBRA_Test

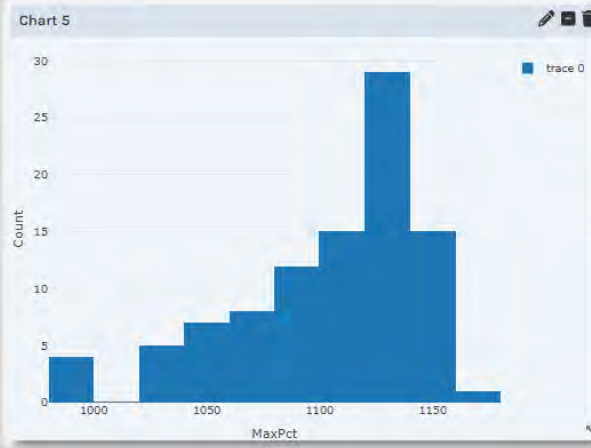
Simulation Case: RELAP_ss_tr_COBRA_center_edge_pp

380 History Result Sets

191 Scalar Result Sets

Chart Creator

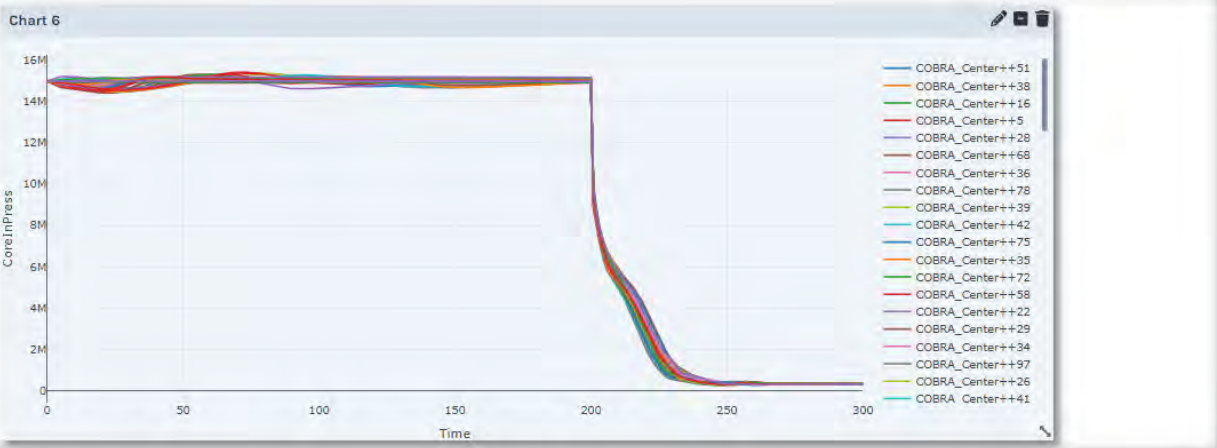
Chart 5



Count

MaxPct

Chart 6



CoreInPress

Time

Simulation Inputs and Results

Inputs

Scalars

Histories

Search in Table: Show entries

Simulation Step Name	Realization Prefix	Unique Run Identifier	Status	DBID	DBRV
COBRA_Center	COBRA_Center++1	1679520036141	PRE	45	1

OGMA-Calcs GOALS

1. Perform data qualification and test result review (e.g., energy/mass balances)

2. Generate boundary/initial conditions from processed test data

3. Compute geometry-derived values (volume, area, hydraulic resistance)

4. Compare simulation output vs. test data using traceable plots and error metrics

5. Build and publish calculation notebooks supporting RDS, EM validation, and reports

6. Create autoregression notebooks with metric tracking

Element 1

Establish requirements for evaluation model capability.

1. Specify analysis purpose, transient class and power plant class.
2. Specify figures of merit.
3. Identify systems, components, phases, geometries, fields and processes that should be modeled.
4. Identify and rank phenomena and processes.

Element 2

Develop assessment base

5. Specify objectives for assessment base.
6. Perform scaling analysis and identify similarity criteria.
7. Identify existing data and/or perform IETs and SETs to complete database.
8. Evaluate effects of IET distortions and SET scale up capability.
9. Determine experimental uncertainties.

Element 3

Develop evaluation model

10. Establish EM developmental plan.
11. Establish EM structure.
12. Develop or incorporate closure models.

Element 4

Assess evaluation model adequacy

Closure relations (Bottom-up)

13. Determine model pedigree and applicability to simulate physical processes.
14. Prepare input and perform calculations to assess model fidelity and/or accuracy.
15. Assess scalability of models.

Integrated EM (Top-down)

16. Determine capability of field equations and numeric solutions to represent processes and phenomena.
17. Determine applicability of EM to simulate system components.
18. Prepare input and preform calculations to assess system interactions and global capability.
19. Assess scalability of integrated calculations and data for distortions.

EM Resolution

20. Determine EM bases and uncertainties.

Has adequacy standard been met?

NO

Return to appropriate Elements, make and assess corrections.

YES

Perform plant event analysis.

EMDAP

OGMA-Calcs Overview



FPoliAAP
By FPoliSolutions, LLC.

Global Search

Dashboard

Account

OGMA-Projects

OGMA-Docs

OGMA-Tests

OGMA-Sim

OGMA-Calcs

Notebooks

OGMA-Calcs Settings

OGMA User Manual

Glossary of Terms

Report an Issue

HDF5 Viewer

Hide Sidebar

Jupyter Notebooks

Import CSV

Export CSV

Import JSON

Export JSON

Search in Table: Show

50

 entries

Calculation Name	Calculation Type	Status	DBID	DBRV
UPTF Test 6 Geometry	Test Facility Geometry	DRAFT	65	26
UPTF Test 6 Hydraulics Characterization	Test Facility Hydraulics	DRAFT	66	24

UPTF

Search Calculation Type

DRAFT

ID

Revis

Showing 1 to 2 of 2 entries (filtered from 65 total entries)

Previous

1

Next

Refresh Table

OGMA-Calcs Overview



FPoliAAP

Global Search

 Dashboard

 Account

Would you like to hide the input datasets in the rendered notebook? *

DONT HIDE

 OGMA

 OGMA

 OGMA

 OGMA

 OGMA

Notebook

 OGMA

 OGMA

 Glossary

 Report

 HDF5

 Hide S

OGMA-Sim Simulation Cases

Add

OGMA-Tests Cases

Add

Imported Database Data

Add

Custom Python Modules

Add

Image Files Attached

Add

Notebook Cells

Add

Output Variables

Add

Metrics

Add

Importing simulation cases (RELAP, TU, COBRA)

Importing OGMA-Test data

Database Entries

Python Modules

Images for report

Jupyter Cells (markdown or python)

Output variables

Metrics

Preview Latest Notebook

Save Inputs

OGMA-Calcs Overview

Notebook Explore Notebook

FPoliAAP Notebook Version 0.0

UPTF Test 6 QuickLook Report

OGMA-Sim Inputs

H5PY File Object Name: UPFT_Run_131_general

HDF5 File Loaded for OGMA-Sim test case with the following attributes:
Simulation: UPTF_Test_6_131
Simulation Case: UPTF_Test_6_131_general

H5PY File Object Name: UPFT_Run_132_general

HDF5 File Loaded for OGMA-Sim test case with the following attributes:
Simulation: UPTF_Test_6_132
Simulation Case: UPTF_Test_6_132_general

H5PY File Object Name: UPFT_Run_135_general

HDF5 File Loaded for OGMA-Sim test case with the following attributes:
Simulation: UPTF_Test_6_135
Simulation Case: UPTF_Test_6_135_general

H5PY File Object Name: UPFT_Run_136_general

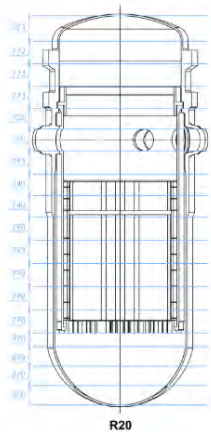
HDF5 File Loaded for OGMA-Sim test case with the following attributes:
Simulation: UPTF_Test_6_136
Simulation Case: UPTF_Test_6_136_general

Table 2.1 Selected Mesh

UPTF

Mesh	Description
04x10	Four azimuthal sections, 10 axial levels

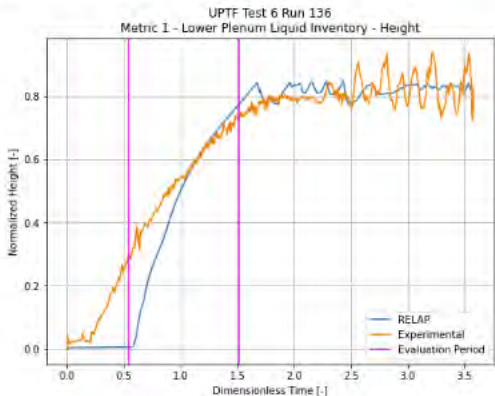
```
In [10]: import base64  
  
with open("R20_mesh.png", "rb") as image_file:  
    R20_mesh = base64.b64encode(image_file.read()).decode()
```



Run 136 Plots

```
In [15]: realization = "uptf_1D_R20_PYRM3_LP_DC04x10_T06_R136"  
run136_resid = UPTF_Test6_Metrics_Quicklook(UPTF_RELAP,UPTF_EXPERIMENTAL136,realization,51.5,67,True,"UPTF Test 6 Run 136")
```

uptf_1D_R20_PYRM3_LP_DC04x10_T06_R136



Methodology and Analysis

3.1 Assessment Metrics

This section describes the Figures of Merit (FOM) and metrics used to assess the RELAP5-3D code in simulating the experiments.

3.1.1 UPTF Test 6 Program Goals

There are seven figures of merit that the simulation runs are used for investigation. For this report, only five will be addressed. Most FoMs have an associated metric and residual that quantitatively assesses the run's validity. Note that there is a dependency between some of the metrics. For example, the CCFL will impact the timing for the ECC liquid to penetrate in the DC. Similarly, the condensation rate impacts the CCFL and ECC bypass ratio. Additionally, calculations of the condensation efficiency depend on liquid temperatures in the lower plenum; if no liquid enters the LP, then the condensation efficiency calculation is nonsensical.

3.1.2 Dimensionless Time

The identified phenomena are evaluated using a specific figure of merit and an associated metric. For each metric, a dimensionless time is used for the independent variable. For this report, most plots are presented using the dimensionless time. The dimensionless time is calculated as the integrated volumetric flow rate of the combined ECC injection divided by the volume of the lower plenum, as follows:

$$\tilde{t}(t) = \frac{\int_0^t (\dot{Q}_{ECC}) dt}{V_{LP}}$$

The tilde ($\tilde{\cdot}$) in this document identifies a dimensionless or normalized value.

3.1.3 Residual Summary

Certain metrics are converted into residuals. The residual reflects the value of the predicted (p) metric minus the measured (m) metric. Since the metrics are time-dependent, the residual is averaged over a selected evaluation period. The average gives a single value residual for each metric. These time-averaged residuals are then easy to compare across codes and code versions.

To calculate the time-averaged residuals, the measured and predicted data are interpolated to the same time array, where the timestep size is constant. The residual is then calculated as the predicted minus the measured value, as shown below. The average residual is then calculated by integrating over the period as, shown below. The residual is time-averaged over a chosen observation period $\Delta \tilde{t}$, summarized in Table 1.2.

$$R(\tilde{t}) = FoM_p(\tilde{t}) - FoM_m(\tilde{t})$$

$$R_i = \frac{1}{\Delta \tilde{t}} \int_{\tilde{t}_i}^{\tilde{t}_{i+1}} |\beta_p(\tilde{t}) - \beta_m(\tilde{t})| d\tilde{t}$$

OGMA-Calcs Overview

Notebook Explore Notebook



Table 3 Residuals Summary

Case No.	Upper Plenum Pressure	Azi. DP in DownComer 1 Resid	Azi. DP in DownComer 2 Resid	Azi. DP in DownComer 3 Resid	Azi. DP in DownComer 4 Resid	Critical Value Percent Resid	Cond. Resid Percent NAN Resid
U666MD01C	1.085830129	0.438233777	0.141412507	0.172141416	0.35812276	79.25063816	3.742203742
U666MD02C	1.085830129	0.438233777	0.141412507	0.172141416	0.35812276	79.25063816	3.742203742
U666MD03C	1.153153164	0.438233777	0.141412507	0.172141416	0.35812276	79.62928439	3.742203742
U666MD04C	1.301048945	0.438233777	0.141412507	0.172141416	0.35812276	79.78656753	3.742203742

Notebook Service Outputs

Show 10 entries

Search:

Notebook Output Variable Name	Notebook Output Variable Name
Azi_DP_DownComer1_Resid	{'U666MD01C': 0.43823377, 'U666MD02C': 0.43823377, 'U666MD03C': 0.43823377, 'U666MD04C': 0.43823377}
Azi_DP_DownComer2_Resid	{'U666MD01C': 0.141412507, 'U666MD02C': 0.141412507, 'U666MD03C': 0.141412507, 'U666MD04C': 0.141412507}
Azi_DP_DownComer3_Resid	{'U666MD01C': 0.172141416, 'U666MD02C': 0.172141416, 'U666MD03C': 0.172141416, 'U666MD04C': 0.172141416}
Azi_DP_DownComer4_Resid	{'U666MD01C': 0.35812276, 'U666MD02C': 0.35812276, 'U666MD03C': 0.35812276, 'U666MD04C': 0.35812276}
Broken_Loop_Pressure_Resid	{'U666MD01C': 2.441263, 'U666MD02C': 2.441263, 'U666MD03C': 2.508778, 'U666MD04C': 2.630658}
Cond_Efficiency_Resid	{'U666MD01C': 0.2720244, 'U666MD02C': 0.2720244, 'U666MD03C': 0.2681382, 'U666MD04C': 0.2577161}
Cond_Resi_Percent_NAN_Resid	{'U666MD01C': 3.742203742, 'U666MD02C': 3.742203742, 'U666MD03C': 3.742203742, 'U666MD04C': 3.742203742}
Critical_Value_Percent_Resid	{'U666MD01C': 79.25063816, 'U666MD02C': 79.25063816, 'U666MD03C': 79.62928439, 'U666MD04C': 79.78656753}
LP_DP_Resid	{'U666MD01C': 0.191573451, 'U666MD02C': 0.191573451, 'U666MD03C': 0.18814211, 'U666MD04C': 0.205143675}
Sigmoid_Growth_Resid	{'U666MD01C': 0.065043204, 'U666MD02C': 0.065043204, 'U666MD03C': 0.06798891, 'U666MD04C': 0.079312287}

Showing 1 to 10 of 14 entries

Previous 1 2 Next



CONTACT

Chris Gosdin
Project Engineer – Modeling and
Simulations Lead
E-mail: cgosdin@fpolisolutions.com
Website: www.fpolisolutions.com