

## SAF User Documentation : Physical Functional Mapping Viewpoint

Domain	Aspect	Maturity
Physical	Traceability & Mapping	 released

### Example

Legend		Proof Of Concept FFDS System 1													
FunctionsOfPhysicalElement		15	3												
FFDS_UseCase															
24-hour Fire Detection and Monitoring															
FFDS A Day in the Life of FFDS(context FFDS Context)															
Add a Sensor Node															
Add a Sensor Node(context FFDS Context)															
Detect and Report Fire		15	3							6	6				
Detect and Report Fire(context FFDS Context)															
Acquire metadata (context FFDS Context)		✓													
Alert fire (context FFDS Context)		✓													
Analyze FF data (context FFDS Context)		✓													
detect heat acc. threshold (context FFDS Context)										✓	✓				
detect smoke acc. threshold (context FFDS Context)										✓	✓				
Display Operator warning (context FFDS Context)		✓													
get visual (context FFDS Context)		✓	✓												
Manage Operator warning (context FFDS Context)		✓													
measure heat level (context FFDS Context)															
measure smoke level (context FFDS Context)										✓	✓				
Provide Sensor Data (context FFDS Context)															
Report fire (context FFDS Context)		✓													
Request Ground Visual (context FFDS Context)		✓													
Request image data (context FFDS Context)		✓													
Request sensor data (context FFDS Context)		✓													
Request weather data (context FFDS Context)		✓													
Retrieve Ground Visual (context FFDS Context)		✓													
Retrieve sat image data (context FFDS Context)		✓													
Retrieve sensor data (context FFDS Context)		✓													
Retrieve weather data (context FFDS Context)		✓													
transmit heat detection (context FFDS Context)		✓	✓							✓	✓				
transmit smoke detection (context FFDS Context)		✓	✓							✓	✓				
Visualize FF data (context FFDS Context)		✓													
Ping a Sensor Node															
Remove a Sensor Node															
Run Observation Test															
Start the System															
Stop the System															
Switch to Maintenance Mode															
Switch to Test Mode															

### Purpose

The Physical Functional Mapping Viewpoint analyses the assignment of the System Functions and the System Partial Functions to the Physical SOI Elements.

## Applicability

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The Physical Functional Mapping Viewpoint supports the "System Architecture Definition process" activities of the INCOSE SYSTEMS ENGINEERING HANDBOOK 2015 .

## Presentation

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A Physical Functional Mapping Matrix featuring

- the call behavior action representing usage of System Functions
- Physical SOI Elements or Physical SOI
- a derived relationship

## Stakeholder

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- [Hardware Developer](#)
- [IV&V Engineer](#)
- [Mechanic Developer](#)
- [Software Developer](#)
- [System Architect](#)

## Concern

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- [What is the allocation of functions to the Physical Elements in the physical architecture?](#)
- [Which functions need to be tested in IV&V activities](#)

## Profile Model Reference

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The following Stereotypes / Model Elements are used in the Viewpoint:

- Allocate [SysML Profile]
- Attribute "function" of SAF\_PhysicalItem referencing SAF\_SystemFunction
- [SAF\\_FunctionAction](#)
- [SAF\\_PhysicalElement](#)
- [SAF\\_PhysicalHardwareElement](#)
- [SAF\\_PhysicalSoftwareElement](#)
- [SAF\\_SPV08b\\_View](#)
- [SAF\\_SystemFunction](#)
- [SAF\\_SystemPartialFunction](#)

## Input from other Viewpoints

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### Required Viewpoints

- [Physical Structure Viewpoint](#)
- [Logical Functional Mapping Viewpoint](#)
- [Logical Structure Viewpoint](#)

## **Recommended Viewpoints**

- [System Process Viewpoint](#)
- [System Functional Refinement Viewpoint](#)