

# Use Case Realization Report

## UCR-08.05 Views Event History



**Sandia  
National  
Laboratories**

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1	Use Case Description .....	3
2	Architecture Description .....	3
3	Use Case Diagram.....	3
4	Class Diagrams .....	3
4.1	Classes - Displays.....	3
4.2	Classes - Event .....	4
4.3	Classes - Event History Display.....	4
4.4	Classes - Event Hypotheses Comparison Display.....	4
4.5	Classes - Event Search Display.....	5
4.6	Classes - View Event Display .....	5
5	Class Descriptions.....	5
6	Sequence Diagrams.....	7
6.1	Flow Overview .....	7
6.2	Main Flow .....	7
6.2.1	Operation Descriptions .....	8
6.3	Expansion Flow - View Event Display - Open.....	8
6.3.1	Operation Descriptions .....	8
7	State Machine Diagrams .....	8
8	SSD Mappings .....	8
9	Notes .....	10
10	Open Issues.....	10
11	Change History .....	10

# 1 Use Case Description

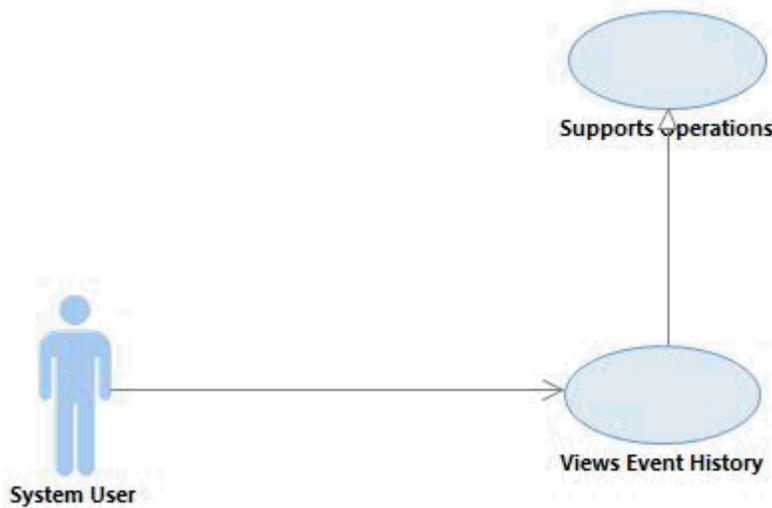
This architecturally significant use case describes how the System User observes the change history of a given event. The change history is a series of one or more saved event hypotheses. System Users view all the event hypotheses and the set of location solutions for each hypothesis. The System User views the relationship between event hypotheses including the preferred hypothesis for each processing stage. The event change history persists across work sessions for subsequent review.

This use case is architecturally significant because it covers review of stored versions of event hypotheses.

# 2 Architecture Description

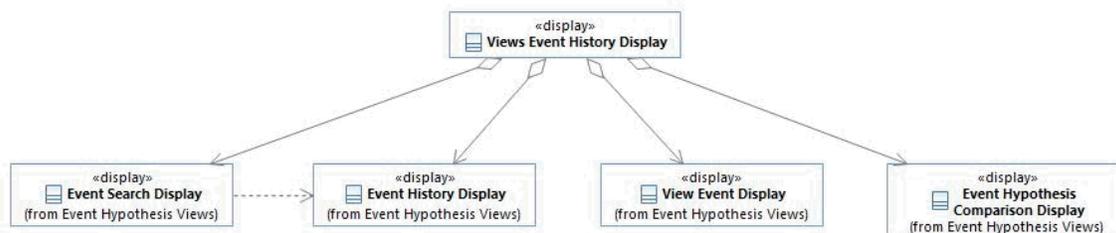
The System User opens the Views Event History Display to select and view an Event and the related Event Hypotheses. The System User selects an Event using the Event Search Display. The System User selects an event and opens the Event History Display. The Event History Display shows all the Event Hypotheses for an Event and the relationships between hypotheses stored by the OSD. The System User can select to view the information for an individual Event Hypothesis using the View Event Display or compare multiple hypotheses using the Event Hypothesis Comparison Display.

# 3 Use Case Diagram



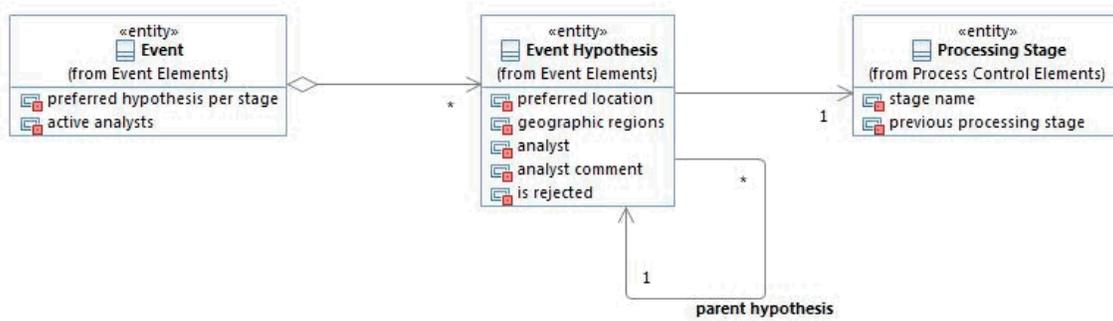
# 4 Class Diagrams

## 4.1 Classes - Displays



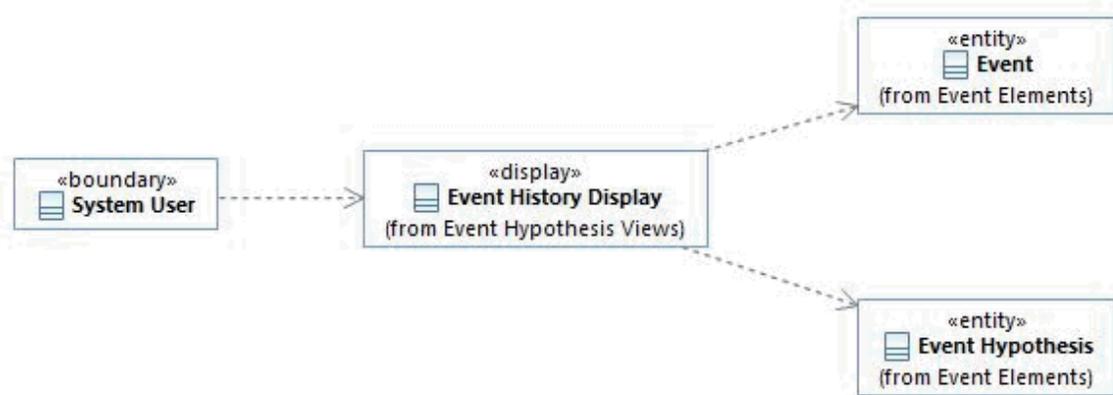
This diagram shows the display classes for selecting and viewing Events and Event Hypotheses. The System User uses the Event Search Display to select an Event. The Event History Display shows the relationships between Event Hypotheses for an Event. The View Event Display shows detailed information about an Event Hypothesis. The System User uses the Event Hypothesis Comparison Display to compare multiple hypotheses.

## 4.2 Classes - Event



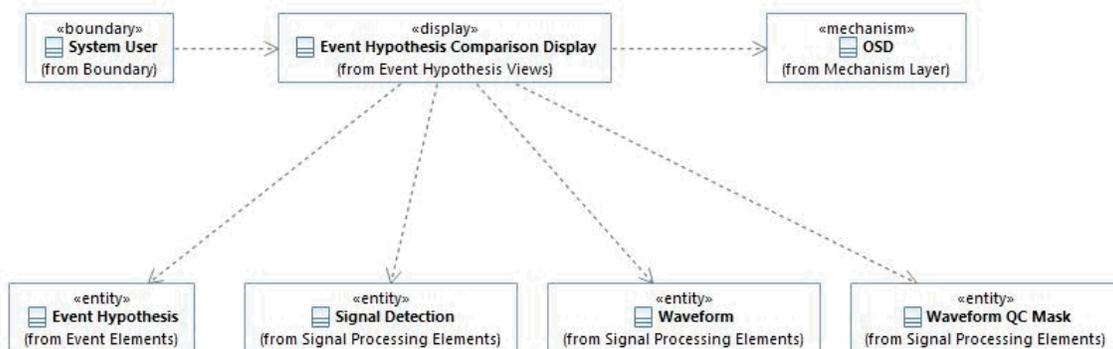
This diagram shows the relationships between Events and Event Hypotheses and the relationships between hypotheses. Each hypothesis is related to its parent hypothesis that was the basis for the child hypothesis. The parent hypothesis can be for the same event or a different event.

## 4.3 Classes - Event History Display



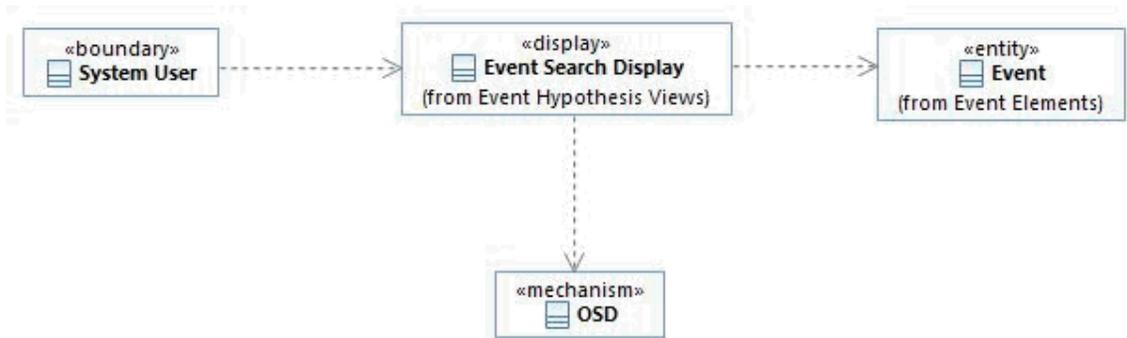
This diagram shows the Event History Display and related classes.

## 4.4 Classes - Event Hypotheses Comparison Display



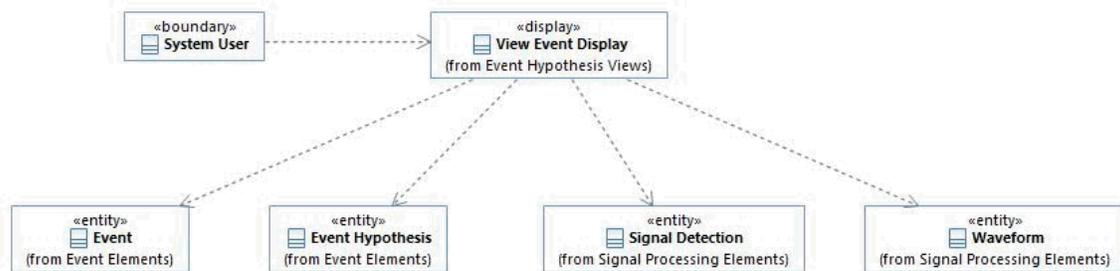
This diagram shows the Event Hypothesis Comparison Display and related classes.

## 4.5 Classes - Event Search Display



This diagram shows the Event Search Display. The System User uses the Event Search Display to select Events and retrieve the Events from the OSD.

## 4.6 Classes - View Event Display



This diagram shows the View Event Display and related classes that provide information about Events and Event Hypotheses.

## 5 Class Descriptions

### <<boundary>> System User

Represents the System User actor.

### <<entity>> Event

Represents information about an Event. Keeps track of all the Event Hypotheses for the event, which hypothesis is the preferred one for each processing stage, the active analysts for the event (i.e. whether the event is under "active review"), whether the event is "complete" for each processing stage, and other event-related information.

### <<entity>> Event Hypothesis

Represents geophysical information about an Event as determined by an Analyst or through pipeline processing. There can be multiple hypotheses of the same Event (e.g. different associated signal detection hypotheses, different location solutions).

### <<entity>> Processing Stage

Represents a named stage of data processing, which may be part of the System Maintainer-defined workflow or an Analyst-defined stage outside the workflow. All Processing Results are associated to a Processing Stage. The "previous processing stage" attribute indicates the stage to be used by as the default starting point when creating new processing results in the stage (e.g. when refining an event in the stage). Note that this attribute is optional, since some stages such as the one for the Duty Officer do not have the concept of a default starting point.

### <<entity>> Signal Detection

Represents information about a Signal Detection and keeps track of all the Signal Detection Hypotheses for the Signal Detection. Represents information about a Signal Detection and keeps track of all the Signal Detection Hypotheses for the Signal Detection. For an unassociated Signal Detection the preferred hypothesis is the most recently created hypothesis. For an associated Signal Detection the preferred hypothesis is the one associated to a preferred Event Hypothesis.

<<*mechanism*>> **OSD**

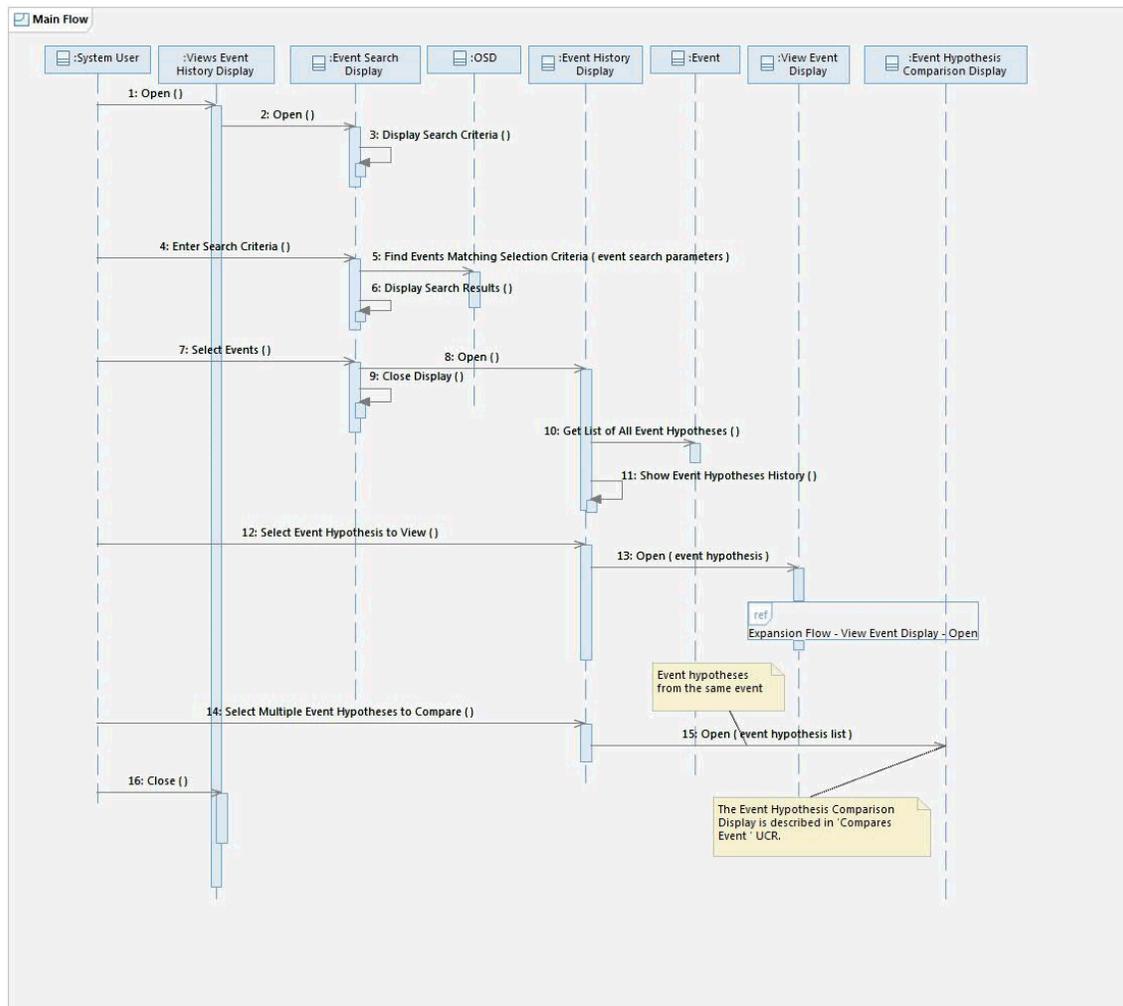
Represents the Object Storage and Distribution mechanism for storing and distributing data objects internally within the system.

# 6 Sequence Diagrams

## 6.1 Flow Overview



## 6.2 Main Flow



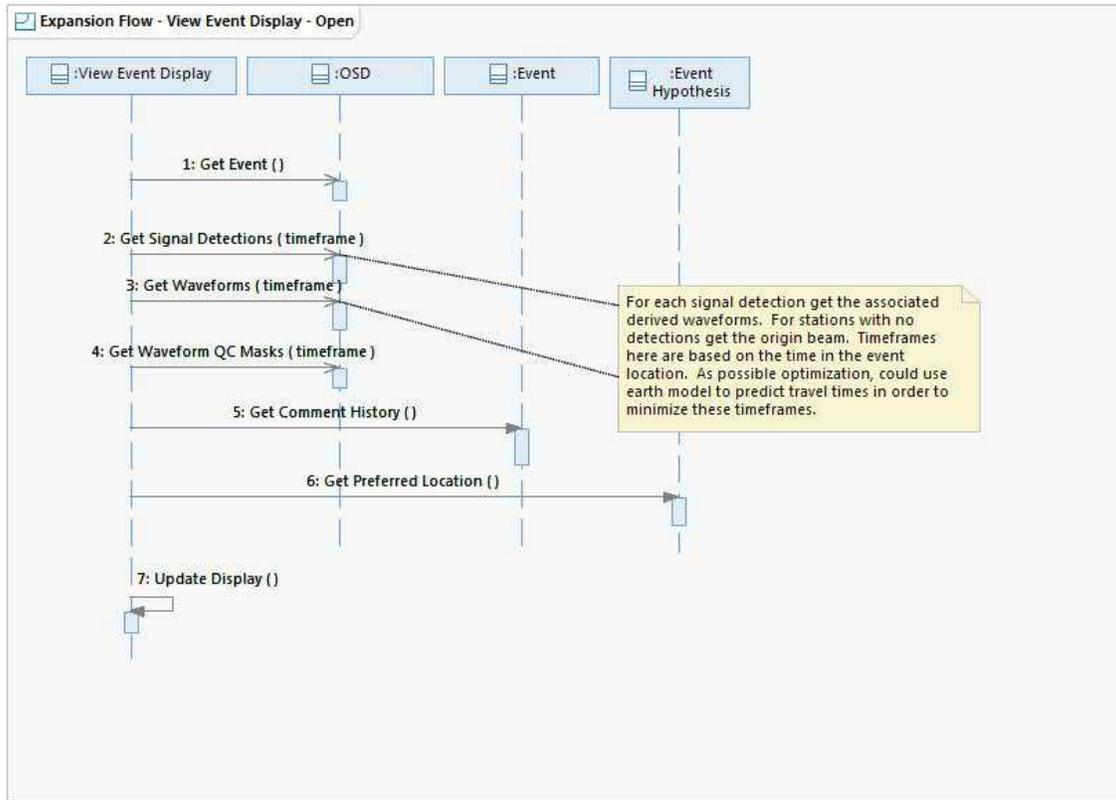
This flow shows how the System User selects an Event and views the event history. Optionally, the System User may view a read-only copy of a selected Event Hypothesis or compare multiple Event Hypotheses.

### 6.2.1 Operation Descriptions

**Operation: Event::Get List of All Event Hypotheses()**

Return a list of all the Event Hypothesis for the given event, including summary information such as the processing stage and which hypotheses have been designated as preferred.

### 6.3 Expansion Flow - View Event Display - Open



This flow shows how the View Event Display is created and the classes contributing information for the display.

### 6.3.1 Operation Descriptions

**Operation: Event::Get Comment History()**

Return all Analyst-entered comments associated with the Event.

## 7 State Machine Diagrams

None

## 8 SSD Mappings

The following SSDs are mapped to this use case:

**S-1292:** [Threshold] The System shall provide the System User the capability to compare Waveform QC Masks generated by each processing stage for selected points in the processing history.

- S-1574:** [*Threshold*] The System shall provide the System User the capability to view station quality metrics.
- S-1586:** [*Threshold*] The System shall provide the Analyst the capability to view event hypothesis quality metrics.
- S-1920:** [*Threshold*] The System shall provide the Analyst the capability to view any saved event hypothesis.
- S-1926:** [*Threshold*] The System shall provide the System User the capability to view the complete history of an event.
- S-1946:** [*Threshold*] The System shall synchronize the System User's displays based on user actions.
- S-1947:** [*Threshold*] The System shall implement user interfaces according to the User Interface Guidelines.
- S-1959:** [*Threshold*] The System shall provide the System User the capability to view on-line help.
- S-1974:** [*Threshold*] The System shall generate graphical images of the results of spatial processing of geospatial data.
- S-1975:** [*Threshold*] The System shall generate tabular listings of the results of spatial processing of geospatial data, e.g. event hypothesis data selected by spatial processing with geographic information.
- S-1985:** [*Threshold*] The System shall provide the Analyst the capability to view event hypothesis data on an interactive map.
- S-1986:** [*Threshold*] The System shall provide the Analyst the capability to view associated and unassociated signal detections on an interactive map.
- S-1987:** [*Threshold*] The System shall provide the Analyst the capability to view station data on an interactive map.
- S-1988:** [*Threshold*] The System shall provide the Analyst the capability to view geographic data on an interactive map.
- S-1989:** [*Threshold*] The System shall provide the Analyst the capability to view active geographic region boundaries on an interactive map.
- S-1990:** [*Threshold*] The System shall provide the Analyst the capability to simultaneously view event hypothesis locations and active geographic region boundaries on an interactive map.
- S-1991:** [*Threshold*] The System shall provide the System User the capability to view on an interactive map whether an event hypothesis location is within active geographic regions.
- S-1992:** [*Threshold*] The System shall provide the Analyst the capability to view on an interactive map whether an event hypothesis location is within an active geographic region for a user specified time.
- S-1993:** [*Threshold*] The System shall provide the Analyst the capability to view on an interactive map whether an event hypothesis location uncertainty bound intersects an active geographic region for a user specified time.
- S-1995:** [*Threshold*] The System shall provide the Analyst the capability to search via GIS for the percentage of an event hypothesis uncertainty ellipse that is within an active geographic region.

**S-1996:** [*Threshold*] The System shall provide the Analyst the capability to access geospatial data.

**S-1997:** [*Threshold*] The System shall provide the Analyst the capability to save geospatial data.

**S-1998:** [*Threshold*] The System shall provide the Analyst the capability to determine the spatial relationships of geospatial data.

**S-1999:** [*null*] The System shall provide the Analyst the capability to view tabular listings of the results of spatial processing of geospatial data.

**S-2000:** [*null*] The System shall provide the System User the capability to view graphical images of the results of spatial processing of geospatial data.

**S-2040:** [*Threshold*] The System shall provide the System User the capability to retrieve stored processing results from computations.

**S-2597:** [*null*] The System shall provide the Analyst the capability to specify the time associated with whether an event hypothesis location or event hypothesis location uncertainty is within an active geographic region.

**S-5603:** [*Threshold*] The System shall provide the Analyst the capability to view inactive geographic region boundaries on an interactive map.

**S-5604:** [*Threshold*] The System shall provide the Analyst the capability to simultaneously view event hypothesis locations and inactive geographic region boundaries on an interactive map.

## **9 Notes**

1. View Event Display is a read-only display of an Event Hypothesis and related information. The event hypothesis information is generated in 'System Detects Event' and 'Refines Event' UCs and includes station quality metrics, event hypothesis quality metrics, map displays including geographic regions and geospatial data, and both unassociated and associated signal detections. Displays will be similar to Analyst displays for 'Refines Event' UC.
2. Event Hypothesis Comparison Display shows QC Masks for associated waveforms per S-1292.

## **10 Open Issues**

None

## **11 Change History**

1. E3 Iteration Review (4/15) - Complete
  - a. Initial release
2. E3 Update (5/15)
  - a. Removed association between Event Hypothesis and Waveform QC Mask classes.