IDC UIS Updates – E2 Reviews to E2 Delivery

Use cases were reviewed with the IDC during trips in January, April and June 2016. In addition, reviews were conducted on the Thursday teleconferences between February and June 2016.

UIS-03 Analyzes Events

- No changes to storyboard after review by the IDC.

UIS-03.01 Selects Data for Analysis

- On slides 11-13
  - Updated the menu options to remove the ambiguous name “Release interval”
  - Added the menu option “Open interval” and clarified that more than one analyst can open and work the same interval. Neither analyst should mark the interval as complete until all events in the interval have been marked as complete.
  - Added the menu option “Close interval” to replace the “Release interval” option and clarified that this option means the analyst is removed from the list of analysts working that interval.
  - Added the menu option “Mark as complete”

UIS-03.02.01 Determines Waveform Data Quality

- Moved the channel mask bullet on slide 3 to the end of the list to emphasize that it is a separate capability
- Moved all slides about the channel mask to be at the end of the slide deck(slides 33-39). The slides that moved were 16, 17, 23, 24, 30, 31 and 36. Added an introductory slide (slide 32) that explains what channel masks are and who can set the channel masks. Added that the channel mask tool is not an Analyst tool but a System Configuration tool.
  - On slide 39 updated the note about modifying the channel mask to say that the end time can be set so that the channel mask ends in the past
- On all slides that showed waveforms:
  - Added an “M” underneath the places on the waveform where there is a mask– both seen and unseen masks
  - Added a note on slide 7 explaining the “M”
  - Updated the left side of the waveform display that names the stations to make sure all the data are raw channels, not derived channels
- Added new slide 13 to show an expanded array that has small masks on two raw waveforms, plus a raw waveform that is orange indicating that there is a rejected mask on this waveform. The notes on the slide discuss that to see where on a derived waveform there are underlying masks that the array has to be expanded and that the orange mask on one raw waveform indicates that this data was missing when the derived channel was created.
- Updated the note on slide 14 to add the sentence “The number of channels that need to be masked to cause the derived waveform to be flagged is configurable by station (seeConfigures Processing Components).”

- Added additional notes (slides 40, 41)
    - Add three sub bullets under bullet #2 to give more information about missing data QC masks
    - Added a new bullet after bullet #3 to explain that to use masked waveform data in processing the Analyst will have to reject the mask first
    - Updated the last bullet to indicate that the "event currently being refined" is being refined by another Analyst

UIS-03.02.02 Enhances Signals

- Created a Key Concepts slide and moved the note that was on the notes slide to this slide. We wanted to emphasize up front that common tasks can be done through the main waveform display and the tables for beaming, rotation, and filters are provided for more advanced methods typically used by researchers
- Generalized the note on slide 7 to include expanding arrays and 3C stations
- Added a note on slide 12 that the Analyst can toggle through filters using the mouse scroll in addition to using a hotkey or menu option
- Added to note on slide 13 to specify that you can double click on a filter from the current filters list and from the available filters list
- Add a note to slide 15 that this is a notional example and each filter type will have different parameters as appropriate
- Added a new slide (slide 16) to explain that in there could be a phase behavior plot of the filter in addition to the amplitude behavior plot. Also that the filter delay would be displayed
- On slide 18 defined the cascading filter as a sequence or composite filter and added a note that the same amplitude and phase response graphics would be available for the cascading filter
- Moved the sample rate notes on slides 23 and 43 to the Notes slide at the end (slide 64)
- Specified that the default deconvolution filter is located in the System filters section under Available filters on slide 25
- On slide 28 pointed out the common instrument toggle at the top right of the waveform display and referred to the waveform common component for more details
- Updated the fk plots on slides 34-42 and 49-57 so they matched the fk plots in Measures Signal Features → plots show the peak, predicted values and user selected point
- Changed the note about expansion on slide 45 to say "3C" instead of "array"
- Added a new note on slide 48 to say that the result of a 3D rotation is three new components added to the waveform display – R (radial), TV (transverse vertical), TH (transverse horizontal)
- Added a new slide (slide 51) that calls out the 2D/3D radio buttons and explaining that 2D specifies only azimuth and that 3D specifies azimuth and slowness.
- Added a purple line on the fk that goes from the center point of the fk through the "X" to the edge of the fk to show the 2D rotation on the slides where the map as a purple great circle path (slides 50, 52-54)

UIS-03.02.03 Detects Signals

- Added a note to slide 16 that the Analyst can pick a default phase, e.g. P, and that all picks made after that will be the default phase.
- Added a note to slide 17 that when an event has been selected all new detections will be automatically associated to that event and changed the color of the P phase pick to be pink to indicate it has been associated to the event.

- Expanded the IDC only note on slide 32 to say that a column can be added to the Signal Detection list that can be used to choose defining/non-defining behavior for screening and point to the Signal Detection List Common Component UIS

UIS-03.02.04 Measures Signal Features

- Added a note on slide 17 clarifying that the thumbnails have a minimum usable size and that the list of thumbnails scrolls to accommodate large events.
- Added a note on slide 17 to explain that the set of fk thumbnails can be filtered based on phase type, station/channel, data type, etc.
- Added a note on slide 17 about how the list of fk thumbnails gets populated – when an event is open for refinement, it shows an fk thumbnail for each associated signal detection. For other tasks, e.g. scanning, user can select a set of detections from another display (e.g., signal detection list, waveform display, map…) to see that set of fks
- Added a note on slide 17 that fks for infrasound detections are also shown on the Az/Slowness tab
- Added a note on slide 20 that the Analyst can toggle on/off a point on the fk that includes a source correction. Show this as another point overlaid on the fk with an arrow pointing from the user-selected peak to the source corrected peak.
- Renamed the tab to be "PMCC" instead of infrasound Az/Slow on slides 30-33
- Added a note on slide 24 that, whenever applicable, capabilities described in the waveform common component also apply to the infrasound channel waveforms shown here (e.g., filtering, sorting, signal detection colors tied to events, showing theoreticals, etc.)
- Renamed "Slowness" to "Velocity" for the y-axis of the pixel map on slides 30-33
- Moved the signal detection markers up above the waveform to match how they are shown in the main waveform display on slides 30-33
- Showed signal detection markers overlaid on the az/velocity pixel maps in addition to the waveforms on slides 30-33
- Added a note on slide 34 that detections are shown here for all phases (not just infrasound) but that filter options are available to limit which phases are displayed
- Added a note on slide 31 that if the user hovers over an individual pixel in the pixel map, they get a tooltip with additional information (e.g., azimuth, frequency content, etc.)
- Added a note on slide 32 that additional stacked plots can be added here (e.g., beam, peak fstat). This is configurable by the Analyst
- Added a note on slide 33 that the polar plot on slide 30 can also be shown as a polar histogram with pixels binned by azimuth
- Added a note on slide 33 that the user can select an azimuthal range via the polar plot (i.e., a wedge) and that will filter the range of azimuths shown in the pixel maps
- Added a note on slide 34 that there is an operations manual outlining all of the capabilities of the IDC's PMCC tool and that this UIS is not to attempting to reproduce all of the functionality that it entails but, instead, capture the key concepts
- Added additional slides for processing HAGs – slides 38-42
    - Showed what a "hydro" mode in the main waveform would entail – including selecting a set of signal detections and creating a HAG, viewing groups of signal detections for existing HAGs, etc.
    - Showed a simple HAG List that the analyst can open to quickly see all existing HAGs for the event open for refinement.

- Showed a separate Hydro fk tab that is very similar to the current HART display. This is to show the fk information in the case of using HAGs. “Standard” hydro fks will still be shown in the Az/Slowness tab as described on Slide 24 and, if HAGs are actually implemented, these two displays might be merged.

UIS-03.02.05 Refines Event Location

- Added a second key concepts slide (slide 4). In the key concepts slides verified that each run could include one or more location solutions depending on configuration and that when an event is saved, the preferred location solution set is stored and the other location solution sets are removed from the table and not stored.
- Moved slide 17 up between slides 13 and 14 for a better flow from top to bottom of the display.
- Added a note on slide 18 that says the Analyst can filter the list of signal detections by phase type to help manage large events.
- Added to the note on slide 25 to explain that the master event could come from a predefined event catalog to make it easier for the Analyst to find the right master event.
- Rewrote the text on slide 26 to make it clear that the detections in the master event relocation list are the intersection of phases from the master and current events.
- Removed the preferred check box from the master row on slide 28 since the master location cannot be the preferred location for the current event.
- Added a new note on slide 20 to explain that the Location History display is not affected by changes such as associating or unassociating signal detections.

UIS-03.02.06 Refines Event Magnitude

- Consolidated slides 7 and 8 and replaced the expanded table image with a new image that shows all the network magnitude table rows collapsed.
- Added a note on slide 8 about expanding a network magnitude row to see station information.
- Called out that the residuals in the station table include a correction on slide 8. Added a note that an optional column can be added to the table to show the mag correction that is being applied to the residual value.
- Reworked slide 15 to include a note that for measurements that the Analyst cannot accept or correct, the station can be set to non-defining for the network magnitude.
- Updated the wording in the third bullet on slide 16: “A relative magnitude calculation depends on the location of selected master event but does not depend on a location solution for the current event. Master Event Relocation is not required prior to performing a Relative Magnitude calculation.”

UIS-03.04 Builds Event

- Added subflow name to slides in order to make the flow of the UIS not as confusing
- Updated note on slide 12 to indicate that when move a phase in a template that all the phases move together
- Added notes on slide 13 to say that a built event gets added to the event list and that if the event requires additional work, e.g. does not converge, it can be selected from the event list and further refined.
- Took out the time block that was shown in the waveform display on slide 17. Added a note that the default time is the entire window and that the Analyst can select a smaller time window if so desired.

- Updated the parameters block on slide 18 to have the stations in alphabetical order and to only show the parameters to section time and stations. Added notes to say that the Analyst can choose to exclude stations and show additional parameters that are hidden on default.
- Updated slide 20 to show a summary window showing the event hypotheses built by the System. It shows only a list of events. Added a new slide (slide 21) that shows the event rows expanded with an explanation that the additional rows are previous versions of the event.
- Added a note to slide 22 to discuss how the Analyst can refine the System-built events using all the available tools until they are satisfied with the results. The Analyst can select the event hypothesis they like and add it to the event list.
- Added a note to slide 24 to explain that the Analyst is selecting channels to be used as inputs for the automatic waveform correlation.
- Updated the parameters box on slide 25 to be like the box on slide 18. This slide shows the additional parameters.
- Updated the note on slide 27 to match what is in slide 22

UIS-07.01 Analyzes Mission Performance

- Updated slide 4 to add bullets that (1) clarifies that these displays provide information to help the user diagnose mission performance, not intended to automatically alert users to trends or abnormalities, (2) explains that this display is intended to serve as a dashboard that each user can customize to suit their needs, (3) this display is intended for internal analysis and not to be exposed to external users, and (4) the data in the displays is populated using System data available through a common object interface.
- Added a note to slide 11 to clarify that the plot amplitudes for each plot type are normalized across all stations by default.
- Updated the notes on slide 12 about how selecting stations on the Performance Overview display or Map display will also select them on the other display.
- Added an additional note on slide 14 about the ability to turn on/off annotations, such as mean value line or standard deviations, on any plot.
- Added an additional note on slide 15 that checkboxes can be used to toggle on/off plot lines.
- Updated slide 18 to use the terminology “present/not present” instead of “legitimate” and “false” to clarify that we are not making assumptions about the nature of the events.
- Re-labeled the plot lines on slide 21 to use the new terminology from slide 18 and added a note that the linkage is based on event ID which is maintained from one processing stage to another.
- Updated the note about event similarity in slide 23 to say that the spatial difference may include uncertainty.
- Updated slide 24 to add a note that the display of uncertainty can be toggled on and off.
- Added slide 25 to show a three line plot to compare events in Catalog A only, events in Catalog B only, and events in both over time.
- Removed the sub bullet under the first bullet on slide 26 because the IDC does not have “monitoring requirements”
- Updated slide 27 to clarify that the box on the map represents defined geographic regions which could include seismically significant regions, and to say that the particular method to use to solve for the magnitude of completeness is still to be determined.
- Added slide 28 which shows the “station contribution threshold” chart for magnitude of completeness.

- Updated slide 29 to clarify that the Analyst can control which stations go into the CTM calculation and add a parameter setting for the confidence level of the calculation.
- Updated slide 41 to better show how data and tools are selected. Updated the notes to clarify that the display only support product level integrated System tools.
- Updated slide 42 to move the notes further to the right to uncover the "count" column in the table for usage data and added a note to refer to this column. Added an additional note that the displayed plots are tied to the selection in the usage data table and that the Analyst can select one row to see data for just that row or select all or not for an aggregated plot.

UIS-11.02 Develops New Algorithms and Models

- Updated the main flow in slide 5 to reflect changes to the use case. The flow now only has three steps instead of five.
- Added an additional bullet to slide 7 about Developing new algorithms and models to say that this step includes creation and execution of unit tests.
- Removed the slides which were about installing the new algorithm and model. This added confusion to the use case and storyboard so these steps were removed.
- Added a new bullet to slide 8 to state that the Researcher needs to perform integration testing of the new algorithm or model to ensure the software implements the required System interfaces.
- Added new slide 10 with a note that clarifies that production-level integration of the new algorithm/model into the System is outside the scope of this UC. This UC ends with the Researcher making recommendations about whether production-level integration should occur.

UIS-13.02 Performs Standalone Analysis

- Added a note on slide 11 about computationally expensive algorithms running on various hardware platforms (laptop, small network…). Clarified that different distributions/packaging of the standalone system might target different hardware requirements.

UIS-14.05 Performs Expert Technical Analysis

- Updated the first bullet on slide 3 to clarify that the UEB is created using only IMS data and System software Added a note about the UEB to explain that it is a bulletin similar to the SEB– it contains event screening scores but no events are actually screened out.
- Added a note on slide 3 to the bullet about the SRMR bulletin reiterating the precondition from the UC that the software is installed on the System, but clarifying that full System integration is not needed.
- Removed the flow chart on slide 6 and added the note that the FARO can choose any processing stage as the starting point for further analysis using the Search display. The FARO opens the event for refinement in a new processing stage, the Expert Technical Analysis (ETA) stage.
- Removed the flow chart on slide 7 and added the note that when the FARO marks the event as complete in the ETA stage, the UEB is automatically created.
- Updated slide 10 to clarify that uploading the SRMR to the web portal will cause users with subscriptions to be notified that the report is available.

Sandia National Laboratories

Defining States Common Component

- Updated the first bullet on slide 3 to clarify that the defining behavioris for an attribute like azimuth or slowness and that the System Maintainer configures the defining rules.
- Updated the first bullet on slide 12 to add the sentence: “Setting the state to Analyst-defining can be used, in some cases, to prevent the System from overriding the setting later on. However there are cases where the System can override Analyst-defining states (e.g., to converge on a location).”

Event List Common Component

- Updated slide 2 to clarify that the event list always shows the preferred event hypothesis for each event.
- Added a new key concepts slide (slide 3) to expand on the differences between saving an event (more like a commit, creates a new event hypothesis) vs. marking the event is complete (done working this event, mark latest version as preferred).
- Updated slide 6 to clarify that the use of a double click to open an event for refinement, and that the row is highlighted in pink.
- Added slide 8 and made it clear that the Event List columns are configurable. Added a note on this slide that the ID column represents a unique identifier that can be used to refer to the event.
- Added a note to slide 9 explaining that the “Active analysts” column indicates if other analysts are actively working the same event.
- Updated slide 11 to show that a rejected event has red text instead of coloring the row red.
- Updated slide 12 to state that saving from the Event List always saves as preferred.
- Added a sentence to the note on slide 12 to clarify that if the current event has no unsaved changes then the Analyst can close the current event and open about event without saving a new version of the event hypothesis.
- Added slide 13 to clarify the synchronization between the event list and the event history display - each time you save the event, a new hypothesis is added to the event history. The slide also shows how the Analyst can set a previous version as preferred from the Event History
- Added new slide 18 with a note that states if a conflict occurs with an event from another time interval that has already been marked as complete, the conflict can be resolved in a subsequent processing stage and that Analysts can use the System messaging capability to notify other Analysts of a conflict that needs to be resolved.
- Removed the “Worked by” and “Stage” columns from the Event List because they are confusing and not needed.
- Updated all slides to gray out the “Mark all Complete” button in screenshotwhere the “Mark Complete” buttons are grayed out.

Undo Redo Common Component

- Updated slides 11-16 to use the updated waveform display.
- Added slide 17 that showed an empty Undo/Redo stack with the text “When the event is saved the Undo/Redo stack is cleared out”

Workspace Management Common Component

- Added a note to slide 14 that says “The workspace can span multiple monitors or windows can be undocked and positioned individually.