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# IDC UC 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.

## UC 02.01 System Determines Waveform Data Quality

- Added a sentence at the end of the Action Description for the Action "Analyze waveform data for data quality errors to call out that the System checks for authentication of the data.
- Added a sentence to the end of General Note #1 to explain that errors and mask types that can be corrected and the processing components where the correction occurs are configurable.

## UC-02.02 System Enhances Signals

- Changed the word "non-continuous" in the first sentence of the 4th paragraph of the brief description to be "segmented.
- Added a second precondition: "QC mask information and corrected waveforms are available."
- Added the step "Calculates detection feature maps" to the mainflow
- Updated the second alternate flow for the main flow to add "if configured to do so".
- Mapped the glossary term "Detection Feature Map" and updated the description.
- Added a new general note: "1. The beam sequence shown in the Subflow-Forms Beams is notional. The sequence of actions is determined by 'Defines Processing Sequence' UC."

## UC-02.04 System Detects Signals

- Updated the brief description to include products derived from waveform data– detection feature maps and frequency-wavenumber transforms.
- Updated the action description for "Detects signal onset time" to use the words "a variety of" in the first sentence instead of "one of the following". Added a sentence before the list that says "Examples of methods are below". Removed the last sentence in the description (The System associates the signal detections to the detection data channel).
- Updated the action description for "Refines signal onset time" to use the words "Examples of methods are listed below" instead of "Options include".
- Updated the action description for "Computes uncertainty of signal onset time" to remove the part about the SNR of the signal detection.
- Updated the action description for "Deconflicts detections created by multiple techniques" to use the words "from multiple techniques" in the second sentence instead of "on multiple detection beams".
- Mapped the glossary terms Detection Feature Map and Z-Detector

## UC-02.05 System Measures Signal Features

- Removed the pre-condition about "expected" signal detections.
- Added text to the brief description about using parameters derived from earth models or historical processing results to support an iterative, feedback-based processing sequence.

- Removed the text about moment rate spectra because it is a signal feature that is only measured for coda magnitudes after the location of the event is known. The text was added to System Refines Event Magnitude UC.

## UC-02.07 System Resolves Event Conflicts

- Updated the first postcondition to remove the clause "that can be resolved by this use case"
- Rearranged the steps in the main flow so that the action "Invokes Subflow– Merge Duplicate Events" comes first.
- Updated the action description for "Finds duplicate event hypothesis" in the Subflow– Merges Duplicate Events to add "spatiotemporal" in front of distance.
- Removed general note #4 which discussed event hypotheses built using waveform correlation.
- Added a new note to explain that the steps in the main flow are notional and that the sequence of the action is determined in the 'Defines Processing Sequence' UC.

## UC-02.09 System Refines Event Magnitude

- Updated the magnitude type list to only include ML, mb and MS in the three places it occurred in the use case
  - o Action description for "Computes magnitude estimate" in the main flow
  - o Action description for "Invoke Subflow– Computes Single Station Magnitude for all associated stations" in the "Computes Network Magnitude Subflow"
  - o Action description for "Computes network magnitude" in the "Computes Network Magnitude Subflow"

## UC-02.10 System Evaluates Moment Tensor

- No changes to use case after review by the IDC.

## UC-02.11 System Finds Similar Events

- No changes to use case after review by the IDC.

## UC-03 Analyzes Events

- Removed General note #1.

## UC-03.01 Selects Data for Analysis

- Updated the action description for "Displays data selection methods" to remove the "List of Events Method". This is really just tagged reference events.
- Updated the text about the Event Set method to explain what it is and to explain that it is geared more for researchers.

## UC-03.02.01 Determines Waveform Data Quality

- Updated the postcondition to read "Waveform QC Masks are created for waveform sections containing data quality errors. Corrected copies of the data with QC issues are also created if configured."
- Updated action descriptions in the subflows to use the words "information which includes" so that the user knows that information that is listed under the actions does not include everything.
- Added glossary term "Channel Mask"

- Updated general note #1 by removing the sentence "The Analyst may manually analyze the data or request automated reprocessing as desired" and replacing it with "The Analyst can request the System reprocess data affected by the modified mask immediately or the System may be configured to reprocess affected data in a subsequent automatic processing stage."

## UC-03.02.02 Enhances Signals

- Removed the precondition.
- Reworked the main flow to be similar to 'System Enhances Signals' UC. This meant adding steps to the flow to calculate frequency-wavenumber (fk) spectrum, and calculate detection feature maps. The text in the action descriptions was updated to account for the new steps.
- Added an alternate flow to the "Subflow – Forms Beams" about if sample rates and/or ground motion is not the same for different channels, the System will notify the user then resample and deconvolve the channels and continue.
- Mapped the glossary term Detection Feature Map and updated the text for the glossary term Filter, Waveform.
- Updated general note #1 to use the word "calculated" instead of "available" in the 4th sentence.
- Added general notes #5 and #6.

## UC-03.02.03 Detects Signals

- Mapped the glossary term Detection Feature Map.
- Removed general notes that discussed amplitude attenuation for infrasonic and hydroacoustic signals and displaying theoretical arrival times.
- Added a general note about referencing empirical knowledge from past events and geophysical models to guide in detecting signals

## UC-03.02.04 Measures Signal Features

- Removed the precondition and postcondition
- Replaced the term "frequency wavenumber" with "array coherency" throughout the document. Added a general note to explain what the term "array coherency" means.
- Removed the general note that defined signal detections from infrasound stations as signal detection groups

## UC-03.02.05 Refines Event Location

- Updated the last sentence in the action description for "Invokes Use Case: System Refines Event Location" to read "The System can change a location defining setting made by the Analyst to be non-defining in order make the location solution converge."
- Updated general note 3 to add the sentence that Multiple event relocation is covered in the 'Performs Multiple Event Relocation' UC.

## UC-03.02.06 Refines Event Magnitude

- Updated the magnitude type list to only include ML, mb and MS in the two places it occurred in the use case
  - Action description for "Refines inputs to single station magnitude calculation" in the "Computes Single Station Magnitude" subflow
  - Action description for "Refines inputs to network magnitude calculation" in the "Computes Network Magnitude" subflow

## UC-03.02.07 Evaluates Moment Tensor

- Was not reviewed with the IDC.

## UC-03.04 Builds Event

- Updated the list of parameters under the action description for "Displays algorithm parameters" in the "Subflow – Automatic Signal Detection Association" to include the set of stations used for forming a new event.
- Removed general note #5 and added the sentences from the note to the action description for "Subflow – Automatic Signal Detection Association"
- Updated the text in the action description for "Displays algorithm parameters" in the "Subflow– Automatic Waveform Correlation" to make it more clear.
- Removed specs that should not be mapped to this use case (CR-2488). These specs are: S-1372, S-1517, S-1542, S-1888, S-1892, S-1893, S-1894, S-1895, S-1896, S-1897, S-1898, S-1899, S-1900, S-1901, S-1902, S-1903, S-1904, S-1905, S-1906, S-1907, S-1908, S-2166, S-2420, S-2603

## UC-14.01 System Assesses Event Consistency

- Dropped this use case and folded the information into UC-14.02 Assesses Event Consistency.

## UC-14.02 Assesses Event Consistency

- Changed the UC Diagram to remove the "System Assesses Event Consistency" UC.
- Updated the brief description to reflect that the Analyst calls the System to do the event consistency check.
- Updated the main flow to add the steps from 'System Assesses Event Consistency" UC. These steps were added to the System side of the flow. They are (1) Calculate event characteristics needed for assessing event consistency, (2) Comparing event characteristics against expected values, and (3) Correct inconsistencies
- Added the text from the System use case to this use case for the new steps added to the flow.
- Updated the name of the step about providing a list of inconsistencies to be "Provides list of event inconsistencies and lists events that do not meet the criteria for migration to the next bulletin". Updated the action description to add the following: "….and lists the events that do not meet Event Definition Criteria and will not be migrated to the Reviewed Event Bulletin (REB). The Event Definition Criteria may be based on the event quality metric."
- Added specs from the System use case and removed S-5817. S-5817 was written because of an issue in the current system where not all database operations and transactional and so it is possible for the database to become inconsistent. We want to reject this spec because our approach is that the re-engineered system will be written in a way that these types of bugs do not occur.

## UC-14.03 System Screens Events

- Updated the brief description to use term "natural phenomena" instead of "non-nuclear" and to call out the names of the bulletins.
- Updated precondition and postconditions to be more clear
- Updated the flow to remove the step "System calculates event screening criteria" and replace it with two steps: "System applies event screening criteria" and "System assigns event screening categories". Updated the text to better follow the language of the treaty.
- Removed alternate flow and the glossary term "Source".

- Removed the two general notes because the information was added to action descriptions. Created a new general note about the customized bulletins that Authorized External Users can request.

## UC-14.04 System Controls Monitoring Stations

- Changed to be a System use case. Added the external actor "IMS Command Generation System".
- Removed preconditions and postconditions.
- Updated main flow to include the IMS Command Generation System actor and added steps for the System to verify commands and send the response back to the IMS Command Generation System.
- Included radionuclide  requests in the types of commands
- Added a third alternate flow to discuss what happens if there is no response from a station.
- Changed S-5586 to be a generic spec for securely issuing commands based on the document that is referenced in the notes. Removed all other specific specs (S-5587, S-5588, S-5589, S-5590, S-5591)
- Removed the glossary term "Station".
- Removed all discussion about using email from the Action Descriptions and included a new note that referenced the document for issuing commands to the stations. The referenced document says the commands are sent by email.