

## Source Tracker Requirements Traceability Matrix

Refer to Section 2.3.2 of the *Source Tracker Software Project Plan*, N-ST-SPP, for information on how the requirements traceability matrix fits into the requirements process. This list contains the mapping of requirements to design elements (which section in the design document) and then to which test cases test that requirement. Note: Test Cases are listed by test plan section number followed by a dash and a test number. The appropriate safety issue is listed for each requirement. If no issue is listed, then that requirement has no safety implications. Refer to the *Source Tracker Safety Software Plan*, N-ST-SSP, for information about dealing with safety issues.

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 1 Verify MAR and Physical Security Limits	Before a transfer is made of a source from one location to another, a calculation must be performed to verify that the transfer will not cause the new location to exceed MAR (CAT 3) or Physical Security (CAT IV) limits, based on government regulation-defined limits found in DOE-STD-1027-92, LA-12981-MS, and DOE M 470.	4.1, 4.7, 4.8, 4.9, 4.10	6, 25, 76, 101, Appendix B & C	MAR
SR 1.1	A window must be displayed showing the MAR and Physical Security values for the current location after the transfer and the values of the new location after the transfer.	4.1	6, 25, 76, 101	MAR
SR 1.2	Sources within ANSI certified containers (exempt sources) must not contribute to MAR values.	4.1	Appendix B	MAR
SR 1.3	There must be a message displayed indicating whether the transfer can occur or not, based on limits being exceeded or not in the new location.	4.1	101, Appendix B & C	MAR
SR 1.4	If the transfer would cause the new location to exceed MAR or Physical Security limits, the transfer must not be allowed and a message must be displayed.	4.1	101, Appendix B & C	MAR

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 1.5	MAR limits must be verified every time a source is transferred to a different location, including when it is removed from its home repository, is returned to its home repository, is re-assigned to a different location or a different owner, or is permanently transferred to another home repository.	4.7, 4.8, 4.9, 4.10	6, 25, 76, Appendix B	MAR
SR 1.6	Before a Remove, Re-assign or Permanent Transfer is made of a source from one location to another, a calculation must be performed to verify that the transfer will not cause the new location to exceed Physical Security Limits (CAT IV), based on government regulation-defined limits found in DOE M 470.4-6.	4.7, 4.9, 4.10	6, 25, 76, 101, Appendix C	
SR 2 Transferring MASS sources	A MASS source must be allowed to be transferred only to another approved MASS location.	4.6, 4.7, 4.9	3, 5, 14, 17, 24, 74	
SR 2.1	When a MASS source is being transferred within the same MBA, the MASS Custodian must be sent an email message about this transfer.	4.6	121	
SR 2.2	When a MASS source is being transferred to a different MBA, a MASS authorized user must also enter his/her Z number (in addition to the user entry of the source bar code and user Z number).	4.6	13	
SR 2.3	When a MASS source is transferred to a different MASS location, a message must be displayed that the MASS system must also be updated.	4.6	73	
SR 3 Remove source from home repository	A capability must be provided for a user to remove a source from its home repository.	4.7	12, 13	
SR 3.1	The user must enter the bar code of the source and his/her Z number and be an authorized user.	4.7	12, 13	
SR 3.2	If the source is currently not located in its home repository, an error message must be displayed.	4.7	71	Inventory problem
SR 3.3	A display must be presented indicating the source description and the transfer details.	4.7	6	

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR3.4	The user must be given the opportunity to complete the transfer, cancel the transfer, or complete the transfer and continue with additional transfers.	4.7	6	
SR 3.5	If the transfer transaction completes successfully, the database must be updated with the new location and source owner.	4.7	9	Inventory
SR 3.6	If the user cancels the operation, no database update will be made.	4.7	8	Inventory
SR3.7	If a source has an expired leak test date, it must not be allowed to be removed.	4.7	100	Leak test
SR 4 Return Source to Home Repository	A capability must be provided to return a source that has been removed from its home repository back to its home repository.	4.8	17, 20, Appendix B & C	
SR 4.1	The user must enter the bar code of the source being returned.	4.8	17, 20	
SR 4.2	It must be verified that the source is currently removed from its home repository (the current location is not its home repository).	4.8	19	
SR 4.3	A message must be displayed showing the home repository for the source.	4.8	17, 19, 20	
SR 4.4	A return must be performed to the home repository.	4.8	21	
SR 4.5	The database must update the source location to its home repository.	4.8	21	Inventory
SR 5 Re-Assign Source's Current Location and/or Owner	A capability must be provided to any user to transfer a source from a location other than its home repository to another location that is not its home repository.	4.9	26	
SR 5.1	The user that wants to be the new owner of the source must enter the bar code of the source, enter his/her Z number, and be an authorized user.	4.9	28	
SR 5.2	The user must select the new location.	4.9	24	
SR 5.3	A display must be presented indicating the source description and the transfer details.	4.9	25	

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 5.4	The user must be given the opportunity to complete the transfer, cancel the transfer, or complete the transfer and continue with additional transfers.	4.9	25	
SR 5.5	If the transfer transaction completes successfully, the database must be updated with the new location and new source owner.	4.9	28	Inventory
SR 6 Transaction Log	A log of transactions must be kept in the database.	4.12	139	MAR, Inventory, Leak test (backup information)
SR 7 Browse Sources	A capability must be provided to display a list of all sources in the database.	4.13	29	
SR 7.1	The user must enter his/her Z number and be an authorized user.	4.13	29	
SR 7.2	The information displayed for each source must include the bar code number, source ID, isotope type, activity level, current owner, location, and MASS value.	4.13, 7	29	
SR 7.3	The user must be allowed to sort the displayed sources by bar code number, source ID, activity value, or MASS value.	4.13	29, 32, 33, 34	
SR 7.4	The user must be allowed to select which sources are displayed based on search criteria.	4.13	41, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53	
SR 7.4.1	The user must be allowed to display only sources of a specified source type or all possible source types. The user must be able to select any combination of source types, including alpha, beta, gamma, plutonium, heat, neutron, and/or uranium.	4.13	41, 44, 45	
SR 7.4.2	The user must be allowed to display only sources containing a specified isotope or all possible isotopes. The user must be able to select any particular isotope found in the database.	4.13	46	

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 7.4.3	The user must be allowed to display only sources currently located in specific locations or select all possible locations. The user must be able to select a particular room or building.	4.13	47, 48	
SR 7.4.4	The user must be allowed to display only sources currently owned by a specific authorized user, all sources not currently owned (in a repository), all sources with an owner (not in a repository), or select all possible owners (in a repository or not).	4.13	49, 50, 51, 55, 56	
SR 7.4.5	The user must be allowed to display only CAT 3 sources or all sources (CAT 3 or not). The user must be able to select CAT 3 sources by building. When the user selects to display only CAT 3 sources, the information displayed for each source must also include the CAT 3 contribution (fraction) of each isotope.	4.13	52, 53	
SR 7.5	The user must be able to view additional details about a source.	4.13	31	
SR 7.6	The user must be able to view a picture of each source if one is available.	4.13	29, 41, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53	
SR 8 Display Category 3 MAR Status for each of the Radiation Facilities	A capability must be provided to display Category 3 MAR status for each building.	4.3	58	
SR 8.1	The user must enter his/her Z number and be an authorized user.	4.3	58	
SR 8.2	The CAT 3 levels for each building must be calculated and displayed as percentages of allowable limits. For each building, the base count, the checked-out RAD can totals, and the total of those values will be displayed.	4.3	58	MAR

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 9 Display Category IV Physical Security Status for each of the MBAs	A capability must be provided to display Category IV Physical Security status for each MBA.	4.4	59	
SR 9.1	The user must enter his/her Z number and be an authorized user.	4.4	59	
SR 9.2	The CAT IV attractiveness levels for each MBA must be calculated and displayed. For each MBA, the B, C, D, and E attractiveness totals for both Plutonium and Uranium must be displayed.	4.4	59	
SR 10 Confirm inventory	A capability must be provided to confirm source inventory.	4.14	60, 61, 65, 68, 69, 70, 71, 72	
SR 10.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.14	60	
SR 10.2	The Custodian must select which sources to inventory. The Custodian must have the option to choose all sources, selected sources, only checked-out sources, or only checked-in sources. The sources chosen must be displayed.	4.14	60, 69	
SR 10.3	A running total must be displayed for sources that need to be confirmed, sources already confirmed, and sources that are unexpected (found at a location other than the current location in the database).	4.14	71, 72	
SR 10.4	The Custodian must enter the bar code of the source being inventoried. The inventory date for that source must be updated in the database.	4.14	68, 70	Inventory
SR 10.5	If the leak test for a source being inventoried has expired, a message must be displayed stating that, along with the last leak test date.	4.14	65	Leak test
SR 10.6	If the source is unexpected, a message must be displayed stating the expected location (the current location in the database).	4.14	71	Inventory problem

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 10.7	If the Custodian quits confirming sources before the chosen sources are all confirmed, a message must be displayed warning the Custodian.	4.14	61	
SR 10.8	When the Custodian has finished inventorying sources, a summarized list of sources just confirmed must be sent to the Custodian in an email message. If a source is unexpected, it must be included in the summarized list. If the Custodian cancels the inventory process, the summarized list of sources must be displayed.	4.14	72	Inventory (backup information)
SR 11 Transfer a source permanently from one location to another	A capability must be provided to change the home repository of a source.	4.10	76	
SR 11.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.10	73	
SR 11.2	The Custodian must enter the bar code of the sources to transfer.	4.10	73	
SR 11.3	The Custodian must select the new home repository location. The source must be allowed to be transferred only to locations approved for permanent storage of a radioactive sealed source.	4.10	74	
SR 11.4	A display must be presented indicating the source description and the transfer details.	4.10	77, 78	
SR 11.5	The user must be given the opportunity to complete the transfer or cancel the transfer.	4.10	77	
SR 11.6	If the transfer transaction completes successfully, the database must be updated with the new location.	4.10	78	Inventory
SR 11.7	If the user cancels the operation, no database update will be made.	4.10	77	Inventory
SR 11.8	If the source being permanently transferred is a MASS source, a message must be displayed that the MASS system must also be updated.	4.10	73	

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 12 Create a summary text file of all sources	A capability must be provided to write summary information about all sources in the database into a text-format file.	4.16	79, 80, 81, 82	
SR 12.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.16	79	
SR 12.2	The text file must be written into the same file system folder as the main database.	4.16	80	
SR 12.3	The information for each source must include bar code number, source ID, isotope, initial activity date, initial MASS value, initial activity, activity from MASS, difference between initial and current activity (as a percentage), current activity, home repository (storage location), current location, current owner, last leak test (last swipe) (date and time), last inventory (date and time), and CAT 3 contribution (as a percentage).	4.16,	82	
SR 12.4	The text file must be emailed to the Custodian and a message must be displayed indicating that the file was sent to the Custodian.	4.16	79	
SR 13 Create a summary database table of all sources	A capability must be provided to write summary information about all sources in the database into a database table file.	4.17	85	
SR 13.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.17	79	
SR 13.2	The database table file must be written into the same file system folder as the main database.	4.17	84	
SR 13.3	The information for each source must include bar code number, source ID, isotope, initial activity date, initial MASS value, initial activity, current activity, home repository (storage location), current location, current owner, last inventory (date and time), last leak test (last swipe) (date and time), and CAT 3 contribution (as a percentage).	4.17, 7	86	
SR 13.4	The database table file must be emailed to the Custodian and a message must be displayed indicating that the database table file was sent to the Custodian.	4.17	86	

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 14 Force Database Read	A capability must be provided to manually force <b>Source Tracker</b> to read its local database.	4.19	87, 88	
SR 14.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.19	88	
SR 14.2	Values displayed by <b>Source Tracker</b> must be updated with the current information entered into the local database.	4.19	88	Inventory
SR 15 Edit program parameters	A capability must be provided to edit program parameters.	4.18	19, 90, 98, 99, 100, 101, 140, 145, 146, 147	
SR 15.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.18	90	
SR 15.2	The Custodian must be allowed to set the current location of a client computer.	4.18	19, 140	
SR 15.3	The Custodian must be allowed to set the serial port of the bar code scanner. If a port is selected and is not open, an error message must be displayed.	4.18	90	
SR 15.4	The Custodian must be allowed to set leak test parameters, which specify intervals allowed between leak tests. The parameters include days permitted for unaccountable RSS sources, and days permitted for accountable or MASS sources.	4.18	98, 99, 100	Leak test
SR 15.5	The Custodian must be allowed to force the system to operate in test mode. Test mode must allow Z numbers and source bar codes to be entered without a bar code scanner.	4.18	90	
SR 15.6	The Custodian must be allowed to set the Physical Security (CAT IV) limits for types B, C, and D for both Plutonium and Uranium. The Physical Security (CAT IV) required limits are specified in DOE M 470.4-6.	4.18	101	
SR 15.7	The Custodian must be allowed to set the main database name and file system folder location.	4.18	145, 146, 147	
SR 15.8	The Custodian must be allowed to set the file system folder location where the database backup is written.	4.18	103, 131, 132, 133, 134	

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 15.9	The Custodian must be allowed to specify whether the database must be automatically backed up daily or not.	4.18	127	
SR 16 Set serial port upon system startup	Upon program startup, an error message must be displayed if the current serial port setting is invalid and a capability to set it to another port must be provided.	4.24	92	
SR 16.1	An error message must be displayed if the program must abort because no valid serial port was set.	4.24	94	
SR 16.2	A message must be displayed if a valid serial port is found, indicating the port that failed and the port that succeeded.	4.24	96	
SR 16.3	A reminder message must be displayed that the serial port parameter must be manually set by the Custodian to become permanent.	4.24	97	
SR 17 Record Leak Testing	A capability must be provided to record that a source was leak tested.	4.15	110, 112	
SR 17.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.15	107	
SR 17.2	The Custodian must select which sources to leak test. The Custodian must have the option to choose all sources, selected sources, only checked-out sources or only checked-in sources. The sources chosen must be displayed.	4.15	110, 116	
SR 17.3	A running total must be displayed of sources that need to be leak tested, sources already leak tested, and sources that are unexpectedly found at a location other than the current location in the database).	4.15	110	
SR 17.4	The Custodian must enter the bar code of the source being updated. The leak test date for that source must be updated in the database.	4.15	110, 112	Leak test
SR 17.5	The Custodian must have the option to also confirm the inventory of a source when the leak testing is recorded. If the Custodian chooses to confirm the inventory at the same time, the inventory date for that source must be also be updated as leak testing is recorded.	4.15	116	Inventory

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 17.6	If the source is unexpected, a message must be displayed stating the expected location (the current location in the database).	4.15	19	Inventory problem
SR 17.7	If the Custodian quits recording sources before the chosen sources are all recorded, a message must be displayed warning the Custodian.	4.15	115	
SR 17.8	When the Custodian has finished recording sources, a summarized list of sources just recorded must be sent to the Custodian in an email message. If a source is unexpected, it must be included in the summarized list. If there are any selected sources still needing leak testing they must be included in the summarized list. If the Custodian cancels the leak test recording process, a summarized list of sources must be displayed.	4.15	116	Leak test (backup information)
SR 18 Verify leak testing	Before a transfer is made of a source from one location to another, leak testing of that source must be checked to see if the leak testing is out of date or not.	4.5, 4.7, 4.14	100	
SR 18.1	If leak testing is past due, there must be a message displayed indicating that the leak testing is out of date, but that it can be transferred anyway.	4.5	100	Leak test
SR 19 Automatic Database Backups	If the automatic daily backup parameter is set, an automatic backup must be made of the local database every day (when <b>Source Tracker</b> is running).	4.20	122	
SR 19.1	The backup file name must include the date.	4.20	123, 126	
SR 19.2	Upon program startup, if the automatic daily database parameter is set and a backup has not been performed for that date, the backup must be performed.	4.20	128, 129, 130	MAR, Inventory (backup information)
SR 20 Manually Backup Database	A capability must be provided to manually backup the master database.	4.21	106	MAR, Inventory (backup information)
SR 20.1	The Custodian must enter his/her Z number and be an authorized Custodian.	4.21	103	
SR 20.2	The Custodian must be allowed to select the file system folder and file name of the backup.	4.21	103	

Unique Number	Requirement	Design Section	Test Case(s)	Safety Issue
SR 21 Manually input MAR (CAT 3) contribution value for a source	A capability must be provided for the Custodian to manually enter a MAR (CAT 3) contribution override value used when verifying MAR limits.	4.2	120	MAR
SR 22 Time-out timers	A time-out timer must be provided for each transaction such that if the user does not complete a transaction within a time limit, the transaction is cancelled and the screen returns to the main menu.	4.11	30	
SR 23	The databases on client computers must be automatically synchronized with the master database at least once per 5 minute interval.	4.23	165, 173	MAR, Inventory, Leak test
SR 24	The following types of information must be stored in the database: <ul style="list-style-type: none"> <li>• Authorized Users</li> <li>• CAT 3 Log</li> <li>• CAT IV Areas</li> <li>• CAT IV Limits</li> <li>• Change History</li> <li>• Locations</li> <li>• MASS Locations</li> <li>• Nuclear Data</li> <li>• Removed/Disposed Sources</li> <li>• Source Types</li> <li>• Sources</li> <li>• System Log</li> <li>• Transaction Log</li> <li>• Warning</li> </ul>	4.3, 7	149 - 162	