

**IALA S-201**

**Product Specification**

**Draft 0.0.7 – July 2017**

IALA AtoN Product Specification

**ANNEX H**

**Annex H Data Validation tests**

**Note: Reference should be made throughout this Annex to S-58, including Appendix A – Spatial operations**

* 1. Columns are as follows

1. IALA S-201 check number.
2. S-58 check number.
3. Check description written in a defined syntax (wherever feasible) syntax defined in this document (1.3).
4. Check message to provide user with meaningful information.
5. Check solution, suggested action to rectify a warning or error.
6. Conformity to, reference to relevant location within the DCEG or PS
7. Check classification - Critical Error (C), Error (E), Warning (W) (see below)
   1. Check Classification

The check classification is intended to ensure errors which would affect the use of the S-201 dataset in a user system are not included in published datasets. The classifications have the following meanings;

C Critical Error An error which would make a dataset unusable in a user systemthrough not loading or causing a user system to crash or presenting data uponwhich is unsafe for navigation.

E Error An error which may degrade the quality of the dataset throughappearance or usability but which will not pose a significant dangerwhen used to support navigation.

W Warning An error which may be duplication or and inconsistency which willnot noticeably degrade the usability of a dataset in a user system.

* 1. Guidelines on the check syntax

In order to ensure that checks can be interpreted clearly and consistently a defined syntax has been used forthe checks wherever possible. Each check is a statement which generates a warning/error if theexpression returns ‘true’.

* + 1. Comparison and Logical Operators

The following comparison and logical operators are used;

* Equal
* Not equal
* Less than
* Less than or equal to
* Greater than
* Greater than or equal to
* AND
* OR (inclusive OR)
  + 1. Spatial Operators

Within this document operators based on those laid out in the ISO standard 19125-1 are used to describespatial relationships tested within the checks. They are described in Annex A of this document.For all spatial operators a default tolerance of 0.125mm at an on-screen scale of 1:10000 should be applied in validation software.

* + 1. Values

The following terms are used for types of values;

* Present – An attribute is present either with or without a value.
* Null – An attribute has a null value (see PS 11.7)
* NotNull – The attribute has been populated with a value.
  + 1. Statements

The checks must be structured using the following statements;

* If – A conditional statement which determines whether a further statement should be executed.
* For – repeat a statement until a statement is met (evaluates to “true”). For the purposes of the checksthe statement being met generates the error or warning specified.
* Switch – test against a variable if this does not match move on to the next test.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S-201 # | S-58 # | Check description | | Check message | Check solution | Reference  (tba) | Data Quality element | Category |
|  | 1 | If any parts of two curves are COINCIDENT. | | Partially duplicated curves. | Remove duplication, add GM\_Point and edit curves as required. |  | Topological consistency | E |
|  | 13a, b, c, d | For each GM\_CompositeCurve where the GM\_Curve records are not referenced sequentially. | | curves are not referenced sequentially | Amend records to reference curves sequentially | S-100 7-5-2-17-1 | Topological consistency | C |
|  | 14 | For each area object where outer or inner boundaries share more than one GM\_Point. | | Outer or inner boundaries share more than one GM\_Point | Amend boundaries so that they share at most one GM\_Point. | S-100 7-5.3.2 | Topological consistency | C |
|  | 15 | For each area outer or inner boundary which is not closed (i.e. the first and last curves bounding the area do not meet at a common GM\_Point). | | First and last curves of an area boundary, do not meet at a common GM\_Point | Amend curves bounding the area to meet at a common GM\_Point. | S-100 7-5.2.12 | Topological consistency | C |
|  | 16 | For each area outer boundary which is not encoded clockwise. | | Area outer boundary not encoded clockwise. | Ensure area outer boundary is encoded clockwise. | S-100 7-5.3.2 | Topological consistency | C |
|  | 17 | For each area inner boundary which is not encoded counterclockwise. | | Area inner boundary not encoded counter-clockwise. | Ensure area inner boundary is encoded counter-clockwise. | S-100 7-5.3.2 | Topological consistency | C |
|  | 20 | For each feature object where a geometric primitive is not one of those permitted. | | Geometric primitive of this type is not permitted on this object class. | Use alternative geometric primitive or alternative object class as required. |  | Conceptual Consistency | C |
|  | 22 | For each edge where the sequence of begin/end points is incorrect. | | Begin/end points are not in the correct sequence. | Amend sequence of begin/end points. | S-100 7-5.3.2 | Topological consistency | C |
|  | 26a | For each attribute where the value is not within the range defined in the S-100 format description. | | Attribute value does not conform to S-100 type specification. | Correct value |  | Domain Consistency | C |
|  | 26b | For each attribute value which is not within the range specified by any attribute constraints in the registry or product specification (for attribute values of type "Real", the resolution given in the format statement by the integer part (e.g. XX.X) must not be checked).Constraints relating the value to another attribute are not checked. | | Attribute value does not conform to domain constraints. | Correct value |  | Domain Consistency | C |
|  | 27 | For each (Text, Date, Time, or S100\_TruncatedDate) attribute which is not formatted in accordance with S-100. | | Attribute value not formatted in accordance with S-100 | Amend formatting of attribute value |  | Domain Consistency | C |
|  | 27 | For each (Text, Date, Time, or S100\_TruncatedDate) attribute which is not formatted in accordance with attribute pattern constraints in the registry or product specification. | | Attribute value not formatted in accordance with pattern constraints in registry or product specification. | Amend formatting of attribute value |  | Domain Consistency | C |
|  | 40 | For any pair feature objects of geometric primitive line where class and attribute values are identical AND all referenced edges have the same spatial attribute values AND which have one or two common connected nodes which is (are) a beginning node or an end node of each linear feature AND each common connected node is not shared by more than two objects which are not chained together. | | Linear objects with the same class, attribute values and spatial attribute values which are connected are not chained together. | Chain linear objects together. |  | Completeness Commission | W |
|  | 46. | For each feature where dateEnd and dateStart are notNull dateEnd is less than or equal to dateStart. | | dateEnd less thandateStart | Amend values of dateEnd or dateStart accordingly. |  | Conceptual Consistency | E |
|  | 47a | For each Light or RadarTransponderBeaconfeaturewhere sectorLimitOne is not Null AND sectorLimitTwo is null or equal to sectorLimitOne. (0 and 360 must be treated as the samevalue.). | | sectorLimitTwo not populated with a valid value, must not be the same a ssectorLimitOne. | Populate sectorLimitTwo with a valid value |  | Conceptual Consistency or | E |
|  | 47b | For each Light or RadarTransponderBeacon feature where sectorLimitTwo is not Null AND sectorLimitOne is null or equal to sectorLimitTwo.(0 and 360 must be treated as the same value.) | | sectorLimitOnenotpopulated with a valid value, must not be the same as sectorLimitTwo. | Populate sectorLimitOne with a valid value. |  | Conceptual Consistency | E |
|  | 50 | For each RecommendedTrackwherecategoryOfRecommendedTrack=1 or NavigationLine feature where its GM\_Points/vertices do not lie on a straight line. | | RecommendedTrack where categoryOfRecommendedTrack=1 or NavigationLine is not a straight line. | Amend geometry to a straight line. |  | Conceptual Consistency | E |
|  | 65 | For each Light feature which EQUALS another Light feature AND status [attribute] does not equal 4[not in use], 6 [reserved] or11 [extinguished] where sectors overlap AND none of the values of the following attributes are different categoryOfLight, exhibitionConditionOfLight, lightCharacteristic, signalPeriod or signalGroup. | | Coincident lights with overlapping sectors and the same characteristics. | Modify light sectors so that they do not overlap, or delete duplicated sectors. |  | Conceptual Consistency | W |
|  | 67 | For each feature where its feature class, attribution andgeometry is identical toanother feature. | | Duplicate feature exists. | Delete duplicate feature. |  | CompletenessCommission | E |
|  | 72 | For each set of hierarchical relationships which form a loop (e.g. no parent feature is child of its own child). | | Relationships form a loop. | Amend relationships to remove loop. |  | Conceptual Consistency | E |
|  | 73a | For each attribute value which contains a leading or trailing space. | | Attribute value contains leading or trailing spaces. | Remove leading or trailing spaces. |  | Domain consistency | W |
|  | 78 | For each area feature where its boundary CROSSES itself. | | Boundary of an area feature crosses itself. | Amend boundary to remove part which crosses itself. |  | Topological Consistency | C |
|  | 79 | For each line feature where component curves CROSSES without a connected GM\_Point at the crossing point. | | Component curvesof a line feature cross without a connected GM\_Point at the crossing point. | Insert connected GM\_Pointat crossing point |  | Topological consistency | E |
|  | 80a | For each area feature where an internal boundary is WITHIN an internal boundary. | | Internal boundary within an internal boundary. | Amend boundaries so that internal boundary is not within anotherinternal boundary. |  | Topological consistency | C |
|  | 80b | For each area feature where an internal boundary is not WITHIN an external boundary. | | Internal boundary outside of an external boundary. | Amend boundaries so that internal boundary is within external boundary. |  | Topological consistency | C |
|  | 80c | For each area feature where an external boundary is WITHIN an internal boundary. | | External boundary within an internal boundary. | Amend boundaries so that internal boundary is within external boundary. |  | Topological consistency | C |
|  | 82 | For each feature of type lineor area which references the same curve more than once. | | Feature references the same curve more than once. | Remove duplicate reference to the curve. |  | Topological consistency | C |
|  | 83 | For each GM\_Point which is COINCIDENT with another GM\_Point (connected or isolated). | | Nodes are coincident. | Delete or amend coincident GM\_Points. |  | Topological consistency | W |
|  | 87 | For each curve with coincident consecutive vertices. | | Consecutive verticesare coincident. | Remove coincidentvertices from curve. |  | Topological Consistency | E |
|  | 89a | For each parent feature which references the same child more than once. | | Parent feature references the same child more thanonce. | Remove duplicatereference to child feature. |  | Conceptual Consistency | C |
|  | 89b | For each child feature which is reference by more than one parent feature. | | Child featurehasmore than one parent. | Remove a parent from child feature. |  | Conceptual Consistency | C |
|  | 98 | For each feature which hasa relationship AND references a feature which does not exist. | | Feature references an feature that does not exist | Remove reference to non-existent feature |  | Format Consistency | E |
|  | 502 | If the cell file size is greater than 20 megabytes. | | The cell is larger than 20Mb in size. | Ensure that the cell is not larger than 20Mb. |  | Format Consistency | E |
|  | 503 | For each feature If the idCode is not unique within this dataset. | | Duplicate idCodes exist within the dataset. | Ensure that no duplicate idCodes exist. |  | Conceptual consistency | W |
|  | 508a | For each feature where more than one value of colour are encoded that colourPattern is ‘Null’. | | Colour has multiple values without a value for colourPattern. | Ensure colourPattern has a value where multiple colour values are encoded. |  | Completeness Omission | E |
|  | 508b | For each feature where colour Pattern is ‘notNull’ that colour is 'Null' OR only has one value. | | colourPattern is populated without multiple colour values. | Ensure multiple colour values are populated or delete colourPattern value. |  | Completeness Omission | E |
|  | 509 | For all feature objects listed below where the attribute stated is ‘Null’  NavigationalSystemOfMarks: marksNavigationalSystemOf | | Mandatory attribute has not been populated with a value. | Populate mandatory attributes; in these cases the object is meaningless without this value. |  | Completeness Omission | E |
|  | 516a | For all parent features of type point which does not EQUAL the child features linked in the same parent/child relationship. | | Parent and child point features do not share the same GM\_Point. | Ensure parent and child point features share the same GM\_Point. |  | Conceptual consistency | E |
|  | 516b | For all parent features of type line where the child feature does not OVERLAP the parent feature. | | Parent and child line features do not overlap. | Ensure the Parent and Child overlap. |  | Conceptual consistency | E |
|  | 516c | For all parent features of type area where the child feature is not WITHIN or TOUCHING the parent feature. | | Child feature of type area does not touch or fall within the parent feature. | Ensure the Child feature touches or lies within the Parent. |  | Conceptual consistency | E |
|  | 517a | For a collection feature record which does not reference at least 1 feature instance. | | Collection feature record does not reference any features. | Ensure the collection feature record references at least 1feature instance |  | Conceptual consistency | E |
|  | 517b | For a collection feature record which references itself. | | Collection feature references itself. | Remove circular reference. |  | Conceptual consistency | E |
|  | 521a | For all features where objectName AND objectNameInNationalLanguage are ‘notNull’ AND that theyare EQUAL | | Values for objectName and objectNameInNationalLanguage are identical. | Ensure that national language attributes are populated with the correct values. |  | Conceptual consistency | W |
|  | 521b | For all features where information [attribute] and informationInNationalLanguage are‘notNull’ AND that they are EQUAL | | Values for information [attribute] and informationInNationalLanguage are identical. | Ensure that nationallanguage attributes are populated with the correct values. |  | Conceptual consistency | W |
|  | 521d | For all features where textualDescription and textualDescriptionInNationalLanguage are‘notNull’ AND that they are EQUAL | | Values for textualDescriptionandtextualDescriptionInNationalLanguageareidentical. | Ensure that nationallanguage attributes are populated with the correct values. |  | Conceptual consistency | W |
|  | 522 | For all features where objectNameInNationalLanguage is ‘notNull’ AND objectName is ‘Null’ OR not present | | Feature name in national language is populated without Feature name. | Populate Feature name. |  | Completeness Commission | E |
|  | 531 | If the file names are not in accordance with the Product Specification. | | File names are not in accordance with the ProductSpecification. | Correct file names. |  | Domain Consistency | C |
|  | 540a | If mandatory records fields and subfields are not included or are null. | | Mandatory records, fields or subfields are not used. | Add mandatory records/values. |  | CompletenessOmission | C |
|  | 542 | For all features of type Light If categoryOfLight is NOTEQUAL TO 1 [Fixed]where signalGroup does not start and finish with a bracket. | | signalGroup is not formatted correctly. | Correct the formatting of signalGroup. |  | Domain Consistency | E |
|  | 557 | For each signalSequence attribute value which does not conform to the correct structure (i.e. string content in accordance with format specification). | | signalSequence attribute not formatted correctly. | Correct formatting of signalSequenceattributevalue. |  | Domain Consistency | E |
|  | 558 | For each feature where signalSequence is ‘not null’ and signalPeriod is ‘not equal to ’the sum of the intervals of lit and eclipse given in signalSequence. | | signalPeriod does not correspond to signalSequence. | Ensure signalPeriod corresponds to the value of signalSequence |  | NonQuantitativeAttributeAccuracy | E |
|  | 559a | For all features where status [attribute] =1 [permanent] with at least one of 2 [occasional], 5 [periodic/intermittent], 7[temporary]; | | Illogical combinationof status [attribute] values. | Amend values for status [attribute]. |  | Conceptual Consistency | E |
|  | 559b | For all features where status [attribute] =3[recommended] with atleast one of 4 [not in use], 11 [extinguished]; | | Illogical combination of status [attribute] values. | Amend values for status [attribute]. |  | Conceptual Consistency | E |
|  | 559c | For all features where status [attribute] =4 [not in use] with at least one of 5 [periodic/intermittent], 9 [mandatory]; | | Illogical combination of status [attribute] values. | Amend values for status [attribute]. |  | Conceptual Consistency | E |
|  | 559d | For all features where status [attribute] =5[periodic/intermittent] with 11 [extinguished]; | | Illogical combination of status [attribute] values. | Amend values for status [attribute]. |  | Conceptual Consistency | E |
|  | 559e | For all features where status [attribute] =9 [mandatory] with 11 [extinguished]; | | Illogical combination  of status [attribute] values. | Amend values for status [attribute]. |  | Conceptual Consistency | E |
|  | 559f | For all features where status [attribute] =16 [watched] with 17 [un-watched]; | | Illogical combination of status [attribute] values. | Amend values for status [attribute]. |  | Conceptual Consistency | E |
|  | 559g | For all features where status [attribute] =8 [private] with 14 [public]; | | Illogical combination of status [attribute] values. | Amend values for status [attribute]. |  | Conceptual Consistency | E |
|  | 568 | For each feature where periodStart AND periodEnd are notNull AND their values are identical. | | Feature has identical values of periodStart and periodEnd. | Ensure values of periodStart and periodEnd are logical. |  | Conceptual Consistency | E |
|  | 569 | For each feature where periodStart is notNull and periodEnd is null or notpresent. | | Feature has periodStart without a value of periodEnd. | Populate periodEnd or remove periodStart. |  | Conceptual Consistency | E |
|  | 570 | For each feature where periodEnd is not Null AND periodStart is null or not present. | | Feature has periodEnd without a value of periodStart. | Populate periodStart or removeperiodEnd. |  | Conceptual Consistency | E |
|  | 572 | For all features where informationInNationalLanguage is ‘notNull’ AND information [attribute] is ‘Null’ OR not present. | | Information innational language is populated without Information. | Populate Information. |  | Conceptual Consistency | E |
|  | 574 | For all features where textualDescriptionInNationalLanguage is ‘notNull’ AND textualDescription is ‘Null’ OR not present. | | Textual description in national language is populated without Textual Description. | Populate textualDescription and include relevant Text file |  | Conceptual Consistency | E |
|  | 1011 | For all attributes textualDescription,  textualDescriptionInNationalLanguage, pictorialRepresentation which  are ‘notNull’ and referenced files do not exist. | | Referenced files are missing | Ensure referenced files exist and are named correctly |  | Completeness Omission | C |
|  | 1011b | For all attributes textualDescription,  textualDescriptionInNationalLanguage, pictorialRepresentation which are ‘notNull’ and value does not conform to the name format in the product specification. | | Referenced filenames are non-conformant | Ensure referenced files are named correctly |  | Domain Consistency | E |
|  | 1019 | For each object where  textualDescription,  textualDescriptionInNationalLanguage are notNull AND the files referenced are identical or empty. | | Files referenced by textualDescription or  textualDescriptionInNationalLanguage are the same or empty | Ensure files are different |  | Completeness Omission or Completeness Commission | W |
|  | 1681 | For each RecommendedTrack feature of type line where orientation is notNull AND the direction of digitising is not greater than 5 degrees greater than or less than the value of orientation. | | RecommendedTrack where orientation does not correspond to the direction of digitising. | Amend value of orientation. |  | Conceptual Consistency | C |
|  | 1682 | For each RecommendedTrack or NavigationLine feature which is not part of an Aggregation collection feature AND is not a RecommendedTrack feature with categoryOfRecommendedTrack equal to (2) [not based on a system of fixed marks]. | | RecommendedTrack or NavigationLine feature not part of Aggregation collection (except RecommendedTrack where categoryOfRecommendedTrack=2). | Add to Aggregation collection feature. |  | Conceptual Consistency | W |
|  | 1683 | For each Aggregationfeature with a single instance of both NavigationLine AND RecommendedTrack AND their orientation values are not equal or reciprocal. | | RecommendedTrack and NavigationLine as part of a Aggregation do not have consistentvalues of orientation. | Amend values of orientation to agree. |  | Conceptual Consistency | C |
|  | 1684 | For each group of features forming a measured distance where the beacons and transit lines are not aggregated into a Aggregation collection feature AND the Aggregation collection features are not aggregated into another Aggregation feature including the track to be followed. | | Measured distance not grouped using Aggregation collection features. | Encode Aggregation features and relate as appropriate. |  | Conceptual Consistency  Completeness Omission | E |
|  | 1721 | For each RadarReflector feature which is associated with a navigationalaid (BeaconXX, BouyXX, LightFloat, LightVessel features). | | RadarReflector encoded ona navigational aid. | Encode radarConspicuous=(3) [radar conspicuous(has radar reflector)}on the navigational aid feature. |  | Conceptual Consistency | E |
|  | 1722a | For each navigational aid equipment feature which is not a child to a navigational aid structure feature OR another navigational aid equipment feature. | | Equipment feature which is not a child of a structure or another equipment feature. | Amend equipment feature to child. |  | Conceptual Consistency | W |
|  | 1723 | For each point feature forming the same navigational aid which does not point to the same spatial feature. | | Feature forming a navigational aid does not point to the same spatial feature. | Ensure all components point tothe same spatial feature. |  | Conceptual Consistency | C |
|  | 1724 | For each navigational aid equipment feature where objectName equals the objectName of the parent feature. | | objectName on navigational aid equipment feature repeats that of the parent feature. | Remove repeated objectName value. |  | Conceptual Consistency | W |
|  | 1726 | If the DataCoverage feature does not EQUAL the combined coverage of NavigationalSystemOfMarks features where marksNavigationalSystemOf is notNull. | | Data coverage not completely covered by NavigationalSystemOfMarks features with a value for marksNavigationalSystemOf. | Ensure complete coverage of NavigationalSystemOfMarks features with marksNavigationalSystemOf populated. |  | Conceptual Consistency | C |
|  | 1727 | For each NavigationalSystemOfMarks feature instance where marksNavigationalSystemOf is not Null which OVERLAPS an NavigationalSystemOfMarks feature where marksNavigationalSystemOf is not Null. | | NavigationalSystemOfMarksfeatures with marksNavigationalSystemOf values overlap. | Amend limits of NavigationalSystemOfMarksfeatures to remove overlap. |  | Conceptual Consistency | C |
|  | 1728 | For each NavigationalSystemOfMarksfeature where orientation is notNullwhich OVERLAPS an NavigationalSystemOfMarks feature where orientation is not Null. | | NavigationalSystemOfMarks features with orientation values overlap. | Amend limits of NavigationalSystemOfMarks features to remove overlap. |  | Conceptual Consistency | E |
|  | 1729 | For each geo feature forming part of a BeaconXX or BuoyXX feature AND marksNavigationalSystemOf is not (9) or (10)where the attributes for structure, topmark and lights do not conform to the value of marks NavigationalSystemOf on the geo feature or the NavigationalSystemOfMarksfeature it is within. | | Component of an aid to navigation does not conform to the IALA system defined on the feature or in NavigationalSystemOfMarks. | Ensure attributes conform to the IALA system encoded in marksNavigationalSystemOf. |  | Conceptual Consistency | E |
|  | 1735 | For each BeaconXX or BuoyXX feature where marksNavigationalSystemOf is present and equal to the value ofmarksNavigationalSystemOf on the NavigationalSystemOfMarks feature it is WITHIN.. | | Value of marksNavigationalSystemOfonBeacon feature is the same as the value on NavigationalSystemOfMarksfeature | Remove duplicatevalue. |  | Completeness Commission | E |
|  | 1750 | For each Light feature which is a child to a BuoyXX feature where height is present. | | height present on Light feature which is child to a BuoyXX feature. | Remove height. |  | Completeness Commission | E |
|  | 1751 | For each Light feature where orientation is present AND categoryOfLight is not (1)[directional function] OR(16) [moiré effect]. | | Orientation populated without categoryOfLight (1) or (16). | Populate appropriate value of categoryOfLight or remove orientation. |  | Completeness Omission | E |
|  | 1752 | For each Light feature where lightCharacteristic is equal to(1) [fixed] AND signalGroup, signalPeriod OR signalSequence are present. | | signalGroup, signalPeriodorsignalSequence present for Light feature where lightCharacteristic = (1) [fixed]. | Remove signalGroup, signalPeriod or signalSequence, not applicable to fixed lights. |  | Completeness Commission | E |
|  | 1756 | For each Light feature where categoryOfLight equals (4)[leading light] AND without categoryOfLight equals (1)[directional function] AND orientation is present. | | orientation present for non-directionalleading light Light feature. | Remove value of orientation. |  | Completeness Commission | E |
|  | 1757 | For each Light feature where categoryOfLight equals (19)[horizontally disposed] or(20) [vertically disposed]AND multiplicityOfLights does not contain a value greater than 1. | | Light feature where categoryOfLight = (19) or (20)without a value of multiplicityOfLights. | Populate the value of multiplicityOfLights. |  | Completeness Omission | E |
|  | 1758 | For each Light feature where categoryOfLight equals (17)[emergency] AND it is not COINCIDENT with another Light feature. | | Light feature isolated and with categoryOfLight (17)[emergency]. | Encode primary Light feature. |  | Completeness Omission | E |
|  | 1762 | For each RadarReflector feature which TOUCHES an feature of type area orpoint having radarConspicuous as an allowable attribute. | | Unnecessary RadarReflector encoded. | Remove unnecessary RadarReflector and encode radarConspicuous = 3 on the associated feature. |  | Completeness Commission | E |
|  | 1764 | For each feature where status [attribute] is equal to (1)[permanent] and periodStart and/or periodEnd are present. | | periodStart and/or periodEnd are present for an feature with status [attribute]=permanent. | Remove periodStart/periodEnd if value of status [attribute] is valid. |  | Completeness Commission | E |
|  | 1766 | For each attribute of type pictorialRepresentation, textualDescription and textualDescriptionInNationalLanguage where the attribute value contains more than one file name. | | pictorialRepresentation, textualDescriptionortextualDescriptionInNationalLanguagecontainmore than one filename. | Amend value to only contain a single filename. |  | Domain Consistency | E |
|  | 1776 | For each Light feature where the value of lightCharacteristic is as listed in the table below AND signalGroupis not as listed in the table below. | | Values of lightCharacteristic and signalGroup are not consistent. | Amend values to be consistent. |  | Conceptual Consistency | W |
| lightCharacteristic | signalGroup |
| 6 | (1) |
| 7 | (1) |
| 9 | () |
| 10 | () |
| 11 | () |
| 28 | () |
|  | 1778 | For each Light feature where categoryOfLight = 1[directional function] AND sectorLimitOne – sectorLimitTwo is greater than 10. | | Light feature with categoryOfLight = (1) with a sector arc greater than 10 degrees. | Check sectorLimitOne/Two values, or remove categoryOfLight = (1). |  | Conceptual Consistency | E |
|  | 1781 | For each Landmark feature which is part of a parent-child relationship AND references a Light feature where categoryOfLight is not (6), (8) or (9) as child ANDFUNCTN does not contain value (33) [light support. | | Landmark feature with a child Light feature without FUNCTN =(33) [light support] |  |  | Conceptual Consistency or Completeness Omission | W |
|  | 1787 | For each NavigationLine and RecommendedTrack which are COINCIDENT AND have values of orientation whichare not equal or reciprocal. | | orientation values for NavigationLine and RecommendedTrack features sharing an curve are not equal or reciprocal. | Ensure values of orientation agree or are reciprocal. |  | Conceptual Consistency | E |
|  | 1788 | For each NavigationLine feature which is COINCIDENT with a RecommendedTrackfeature AND are not part of the same Aggregation feature. | | NavigationLine and RecommendedTrack share an curve but are not aggregated using Aggregation. | Aggregate features using Aggregationfeature. |  | Conceptual Consistency | W |
|  | 1789 | For each feature of typeNavigationLine and RecommendedTrack where orientation is not Null AND the orientation of the spatial geometry is more than 5 degrees greater than or less than the value (or reciprocal) of the value of orientation. | | NavigationLine or RecommendedTrack where the orientation of the geometry is not consistent with the value of orientation. | Populate an appropriate value of orientation consistent with the geometry of the feature. |  | Conceptual Consistency | C |
|  | 1790a | For each Light feature where orientation is not Null AND sectorLimitOne OR sectorLimitTwo are not Null. | | Light feature where orientation and sectorLimitOne/sectorLimitTwo are populated. | Remove values of sectorLimitOne/sectorLimitTwo or orientation. |  | Completeness Commission | E |
|  | 1790b | For each Light feature where orientation is not Null AND it is aggregated to a RecommendedTrack or NavigationLine within a collection feature Aggregation. | | Light feature where orientation and is aggregated within an Aggregation collection feature. | Set Orient to NULL |  | Completeness Commission | E |
|  | 1790c | For each Light feature where orientation is not Null AND the structure feature of this Light feature is aggregated to a RecommendedTrack or NavigationLine within a collection feature Aggregation. | | Light feature where orientation and the parent structure feature is aggregated within a Aggregation collection feature. | Remove the Light structure parent feature from Aggregation collection feature aggregation. |  | Conceptual Consistency | E |
|  | 1791 | For each NavigationLine feature where CATNAV = 3 which is not COINCIDENT with a RecommendedTrack where categoryOfRecommendedTrack =1. | | NavigationLine with CATNAV =3 but does not share the line geometry of a RecommendedTrack with categoryOfRecommendedTrack = 1. | Ensure NavigationLinewithCATNAV = 3 has a coincident RecommendedTrack with categoryOfRecommendedTrack = 1. |  | Completeness Commission if RecommendedTrack missing otherwise Conceptual Consistency | E |
|  | 1793 | For each parent/child relationship which references more than one Light feature AND all of the Light features are encoded with lightVisibility = 6 or7. | | Group of Light where all are lightVisibility= 6 or 7. | Confirm values of lightVisibility or encode primary light. |  | Conceptual Consistency  If primary light is missing, Completeness Omission | E |
|  | 1794 | For each Light feature where categoryOfLight = (1) AND isa child in a parent/child relationship AND the parent feature is any of BuoyXX, LightVessel or LightFloat. | | Directional light a child to a parent feature of type BuoyXX, LightVessel or LightFloat. | Amend parent to a logical feature or remove value of categoryOfLight. |  | Completeness Commission if categoryOfLight is excess, otherwise Conceptual Consistency | E |
|  | 1795 | For each feature which is a parent in a parent/child relationship AND where dateEnd, dateStart ,periodEnd or periodStart are not Null AND the values of dateEnd, dateStart, periodEnd or periodStart are not identical to those on the child features. | | Temporal attributes on a parent feature do not match those on child features. | Populate appropriate temporal attributes on child features. |  | Conceptual Consistency | C |
|  | 1803 | For each Parent/Child relationship where referenced features have been populated with different values for SCAMIN. | | Different values of SCAMIN on features which are in a parent-child relationship. | Amend values of SCAMIN to agree. |  | Conceptual Consistency | W |