Concepts for Associations

Raphael Malyankar

OVERVIEW
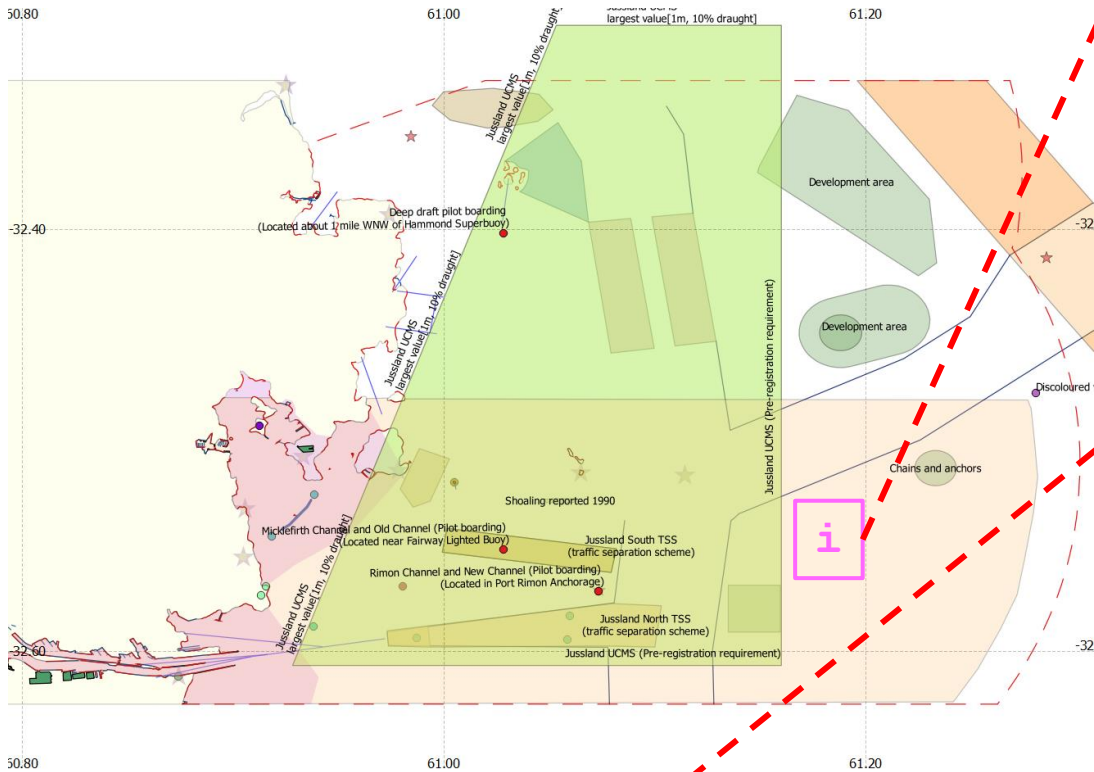
- U/I concepts
- Recommendations for Product Specification documents
  - Template language for describing associations for producers
  - Template language for portrayals
- Concepts described in this presentation are discussion items for further consideration

PRODUCER: BASIC UI CONCEPT

Diagram(s), encoding instructions from DCEG, and Remarks from feature catalogue
(encoding instructions in editor interface only – Pick report shows FC remarks, entry helper shows DCEG content and diagram(s).)

Pick (side?) report/hover box/entry helper at 32° 33.456' S 061° 20.987' E
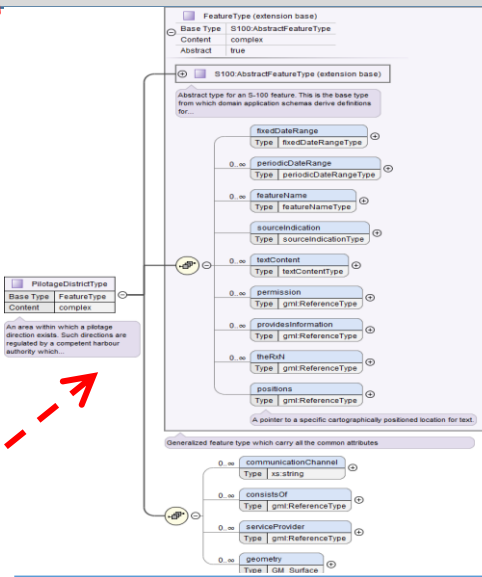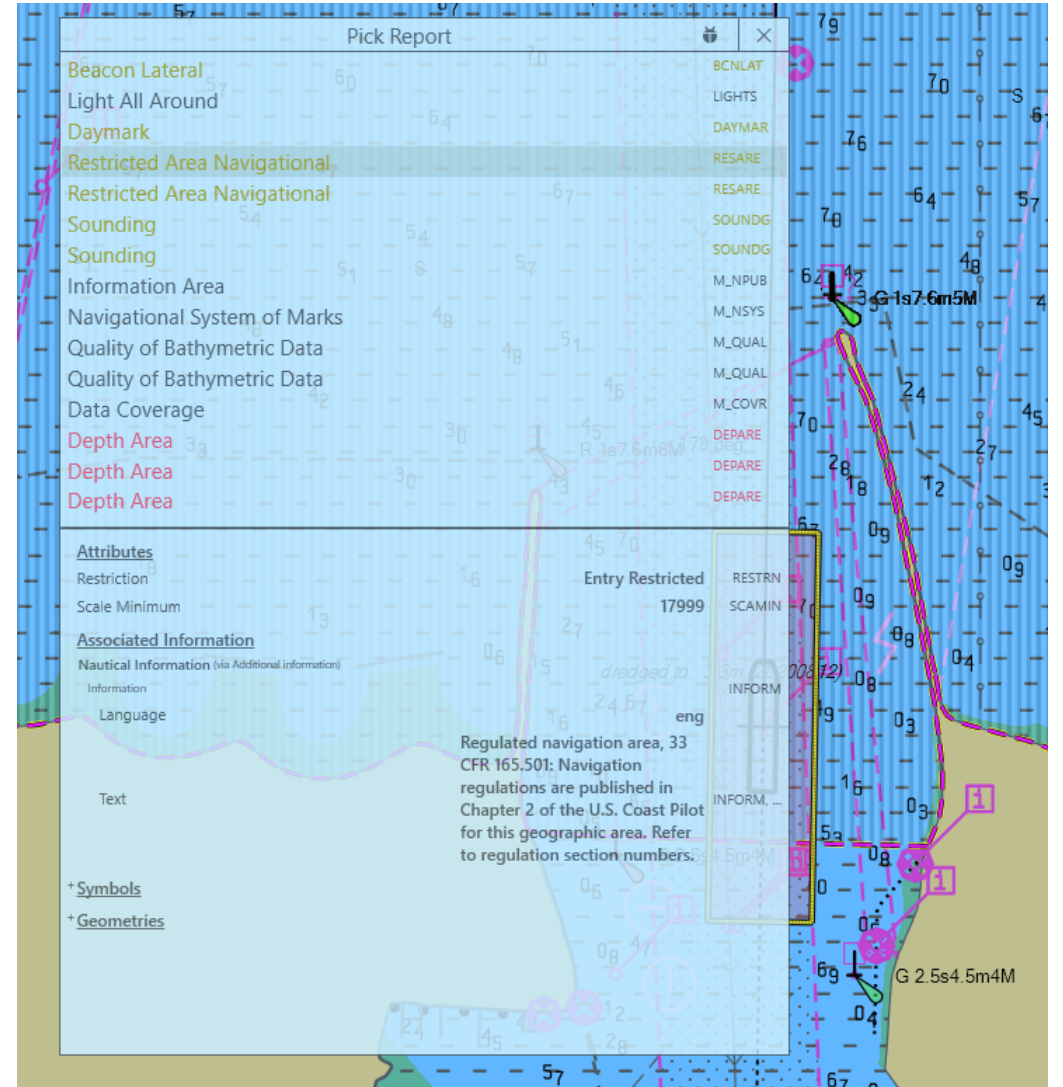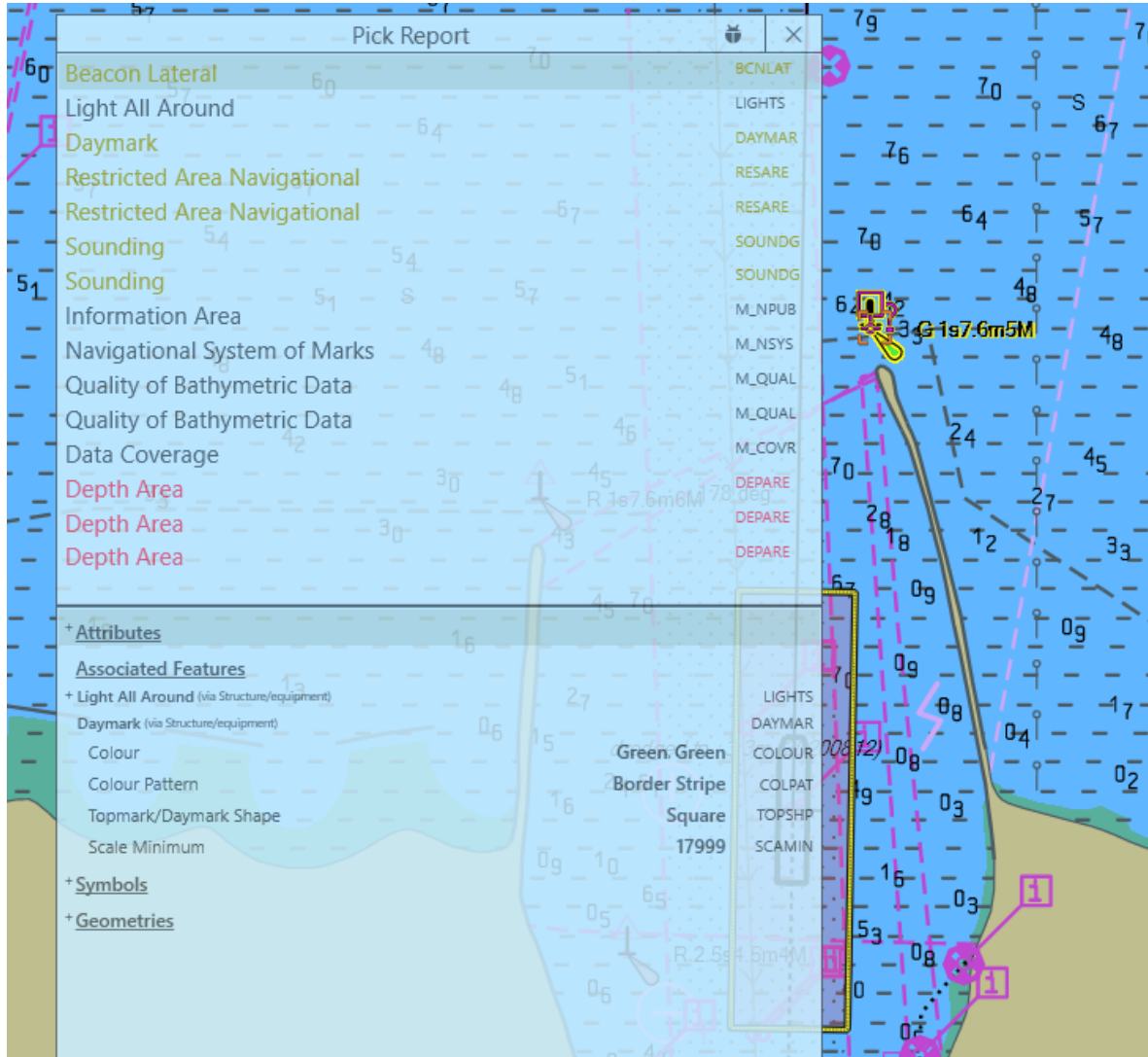
PilotageDistrict Feature Attributes
Micklefirth Pilotage District

fixedDateRange	dateStart
	dateEnd
periodicDateRange	dateStart
	dateEnd
featureName	name
	displayName
	language
sourceIndication	...
textContent	...
communicationChannel	...

PilotageDistrict Relationships

Permission	hyperlink(JS.APPLIC.01), hyperlink(JS.APPLIC.02A), hyperlink(JS.APPLIC.02A), hyperlink(JS.APPLIC.02A), hyperlink(JS.APPLIC.02A)
Provides information	[ADD LINK (editor interface only)]
The RxN	[ADD LINK (editor interface only)]
Positions	[ADD LINK (editor interface only)]
Consists Of	Hyperlink(JS.PILBOP.03)
Service Provider	hyperlink(JS.PLTSRV.01), hyperlink(JS.PLTSRV.02)

APPLICATION: BASIC UI CONCEPT

Images Courtesy NIWC

EDITOR UI - APPLICABILITY

Applicability	Describes the relationship between vessel characteristics and: (i) the applicability of an associated information object or feature to the vessel; or, (ii) the use of a facility, place, or service by the vessel; or, (iii) passage of the vessel through an area.	
Record Identifier	(automatic)	

Fixed Date Range

		Day	Month	Year	MonthDay	YearMonth	Date	Start date must precede end date
	Start							
	End	Day	Month	Year	MonthDay	YearMonth	Date	

Periodic Date Range

		Day	Month	Year	MonthDay	YearMonth	Date	Start date must precede end date
	Start							
	End	Day	Month	Year	MonthDay	YearMonth	Date	

Feature Name

Display Name		
Language	No linguistic content ▾	Use "no linguistic content" for working name
Name	Draft > 8m	

Source

Category of Authority	agricultural ▾		
Country Name			
Name	Display Name		Name of source
	Language	Use "no linguistic content" for working name	
	Name		
Reported Date	Day / Month / Year / MonthDay / YearMonth / Date		
Source			
Source Type	official publication ▾		

Linked Naut. Info.		
In Ballast	☐	Whether the vessel is in ballast.
Cargo	ballast ▾	
Dangerous Or Hazardous Cargo	IMDG Code Class 1 Div. 1.2 ▾	

Category Of Vessel	bulk carrier ▾	
Vessel Registry	domestic ▾	
Combine conditions with:	AND ▾	
Ice Capability		The thickness of ice that the ship can safely transit

Information (complex)

File Locator		Anchor id for XML or HTML
File Reference		Name or URI. Do not populate if *text* is populated.
Headline		
Language	English ▾	
Text		Do not populate if file reference is populated.

Vessel Performance		A description of the required handling characteristics of a vessel including hull design, main and auxilliary machinery, cargo handling equipment, navigation equipment and manoeuvring behaviour.

Vessels Measurements

Operator	greater than or equal to ▾
Characteristic	draught ▾
Value	8
Unit	metre ▾

	Generally only one of the links below will be populated.	
Linked Feature		Automatically populated when this instance is linked from a feature
Linked Reg / Res / Rec / NInfo	NauticalInformation ▾ (dynamic list) ▾	

When ALL conditions satisfied	*Cargo:* dangerous or hazardous		
	Dimension	**compared to**	**Limiting value**
	gross tonnage	greater than or equal to	1600 gross ton

Miscellaneous conditions: Also applies to all barges carrying dangerous cargo. Vessels are not required to send the 24-hour notification if they are participating in AMVER.

```xml
<S127:Applicability gml:id="JS.APPLIC.09">
  <categoryOfCargo>dangerous or hazardous</categoryOfCargo>
  <information>
    <text>Also applies to all barges carrying dangerous cargo. Vessels
R.</text>
  </information>
  <vesselsMeasurements>
    <comparisonOperator>greater than or equal to</comparisonOperator>
    <vesselsCharacteristics>gross tonnage</vesselsCharacteristics>
    <vesselsCharacteristicsValue>1600</vesselsCharacteristicsValue>
    <vesselsCharacteristicsUnit>gross ton</vesselsCharacteristicsUnit>
  </vesselsMeasurements>
  <theShipReport xlink:href="#JS.SHPREP.751"/>
</S127:Applicability>
```

When ALL conditions satisfied	*Vessel type:* other: all types including barges *Cargo:* dangerous or hazardous

```xml
<S127:Applicability gml:id="JS.APPLIC.10">
  <categoryOfCargo>dangerous or hazardous</categoryOfCargo>
  <categoryOfVessel>other: all types including barges</categoryOfVessel>
  <theShipReport xlink:href="#JS.SHPREP.777"/>
</S127:Applicability>
```

For	*Miscellaneous conditions:* All ships that depart from foreign port and intend to enter Jussland ports

```xml
<S127:Applicability gml:id="JS.APPLIC.11">
  <information><text>All ships that depart from foreign port and
  <theShipReport xlink:href="#JS.SHPREP.803"/>
  <theShipReport xlink:href="#JS.SHPREP.832"/>
</S127:Applicability>
```

For	*Miscellaneous conditions:* Vessels departing from Jussland ports

```xml
<S127:Applicability gml:id="JS.APPLIC.11A">
  <information><text>Vessels departing from Jussland ports</
  <theShipReport xlink:href="#JS.SHPREP.832"/>
</S127:Applicability>
```

For	*Miscellaneous conditions:* Vessels with any of the following dangerous conditions on board: (1) Occurrence of fire. (2) Vessel involved in a collision or grounding. (3) Any defect in the ship's hull. (4) Any defect in the ship's main propulsion, electrical or steering systems. (5) Any defect in the ship's radio equipment, radar, or compasses. (6) Any defect is the ship's anchors or ground tackle.

```xml
<S127:Applicability gml:id="JS.APPLIC.12">
  <information><text>Vessels with any of the following dangerous conditions on board: (1) Occurrenc
grounding. (3) Any defect in the ship's hull. (4) Any defect in the ship's main propulsion, electrical
radio equipment, radar, or compasses. (6) Any defect is the ship's anchors or ground tackle.</text></in
  <theShipReport xlink:href="#JS.SHPREP.843"/>
</S127:Applicability>
```

```xml
<S127:Applicability gml:id="JS.APPLIC.13">
  <information><text>(1) United States flag merchant vessels of 1,000 gross tons
s tons or more, for which an Interim War Risk Insurance Binder has been issued ur
.</text></information>
  <vesselsMeasurements>
    <comparisonOperator>greater than or equal to</comparisonOperator>
    <vesselsCharacteristics>gross tonnage</vesselsCharacteristics>
    <vesselsCharacteristicsValue>1000</vesselsCharacteristicsValue>
    <vesselsCharacteristicsUnit>gross ton</vesselsCharacteristicsUnit>
  </vesselsMeasurements>
  <theShipReport xlink:href="#JS.SHPREP.85"/>
  <theShipReport xlink:href="#JS.SHPREP.89"/>
  <theShipReport xlink:href="#JS.SHPREP.92"/>
  <theShipReport xlink:href="#JS.SHPREP.99"/>
</S127:Applicability>
```

When ALL conditions satisfied	**Dimension**	**compared to**	**Limiting value**
	gross tonnage	greater than or equal to	1000 gross ton

Miscellaneous conditions: (1) United States flag merchant vessels of 1,000 gross tons or more, operating in foreign commerce. (2)Foreign flag vessels of 1,000 gross tons or more, for which an Interim War Risk Insurance Binder has been issued under the provisions of Title XII, Merchant Marine Act, 1936.

```
<S127:Applicability gml:id="JS.APPLIC.02C">
  <categoryOfVessel>other: all types including tug and tow</categoryOfVessel>
  <logicalConnectives>logical conjunction</logicalConnectives>
  <vesselsMeasurements>
    <comparisonOperator>greater than or equal to</comparisonOperator>
    <vesselsCharacteristics>length overall</vesselsCharacteristics>
    <vesselsCharacteristicsValue>50</vesselsCharacteristicsValue>
    <vesselsCharacteristicsUnit>metre</vesselsCharacteristicsUnit>
  </vesselsMeasurements>
  <vesselsMeasurements>
    <comparisonOperator>less than</comparisonOperator>
    <vesselsCharacteristics>length overall</vesselsCharacteristics>
    <vesselsCharacteristicsValue>90</vesselsCharacteristicsValue>
    <vesselsCharacteristicsUnit>metre</vesselsCharacteristicsUnit>
  </vesselsMeasurements>
  <vesselsMeasurements>
    <comparisonOperator>greater than or equal to</comparisonOperator>
    <vesselsCharacteristics>draught</vesselsCharacteristics>
    <vesselsCharacteristicsValue>6</vesselsCharacteristicsValue>
    <vesselsCharacteristicsUnit>metre</vesselsCharacteristicsUnit>
  </vesselsMeasurements>
</S127:Applicability>
```

	Vessel type: other: all types including tug and tow		
When ALL conditions satisfied	**Dimension**	**compared to**	**Limiting value**
	length overall	greater than or equal to	50 metre
	length overall	less than	90 metre
	draught	greater than or equal to	6 metre

```
<S127:Applicability gml:id="JS.APPLIC.02D">
  <categoryOfVessel>other: all types including tug and tow</categoryOfVessel>
  <logicalConnectives>logical conjunction</logicalConnectives>
  <information><text>When restricted visibility exists</text></information>
  <vesselsMeasurements>
    <comparisonOperator>greater than or equal to</comparisonOperator>
    <vesselsCharacteristics>length overall</vesselsCharacteristics>
    <vesselsCharacteristicsValue>50</vesselsCharacteristicsValue>
    <vesselsCharacteristicsUnit>metre</vesselsCharacteristicsUnit>
  </vesselsMeasurements>
  <vesselsMeasurements>
    <comparisonOperator>greater than or equal to</comparisonOperator>
    <vesselsCharacteristics>draught</vesselsCharacteristics>
    <vesselsCharacteristicsValue>4</vesselsCharacteristicsValue>
    <vesselsCharacteristicsUnit>metre</vesselsCharacteristicsUnit>
  </vesselsMeasurements>
</S127:Applicability>
```

	Vessel type: other: all types including tug and tow		
When ALL conditions satisfied	**Dimension**	**compared to**	**Limiting value**
	length overall	greater than or equal to	50 metre
	draught	greater than or equal to	4 metre

Miscellaneous conditions: When restricted visibility exists

RECOMMENDATIONS - PRODUCT SPECIFICATIONS

- All (NPUB) product specifications should include clause(s) summarizing the feature and information associations in the model. One or more UML diagrams capturing the relationships should be included. In order to reduce diagram clutter, attributes should not be included.

- The Product Specification should include a section describing feature bindings, preferably as a reproduction, summary, or elaboration of S-100 5-4.2.5.2 and 5-4.2.5.3, though a reference to those clauses may suffice.
  - Based on S-100WG7 discussions, these S-100 clauses *might* be revised soon.

- Product Specifications should describe portrayal of information types common to multiple NPUB product specifications:
  - Schedules (ServiceHours, NonStandardWorkingDay)
  - Regulations, Restrictions, Recommendations, Nautical Information
  - Limitations by vessel characteristics

- The Portrayal section of a Product Specification which uses Applicability information type to describe the applicability of regulations (and recommendations, etc.) to vessels should include the paragraph below.

  The text generated [from instances of the information type Applicability] should be linked or otherwise related to the feature or information type to which it applies depending on the nature (and attributes, if any) of the association between Applicability and the feature or information type to which it is associated. For example, the text generated might be preceded by the text of the linked Regulation (for InclusionType associations), or the text generated from Applicability appear in a hover box linked to a geographic feature (for PermissionType associations).

RECOMMENDATIONS - DCEG

- DCEGs should define terms and abbreviations using more accessible language than Product Specifications and S-100.

- Template for common clause describing associations, based on existing clause 2.5 (Associations).

- Each feature table should include a UML diagram...not showing attributes, only associations for the class described by the feature table.

- Each "theme section" in the DCEG should have an introductory section describing the associations between features comprising that theme, to/from other features. Diagram(s) should be included.

- Regulations, schedules, and limitations by vessel characteristics (Applicability) are common to multiple NPUB product specifications. Template clauses are supplied for each of these "themes".

11.4 Schedules

Schedule information is encoded in the **ServiceHours** and **NonStandardWorkingDay** information types. Schedules should be displayed as tabulations according to the day of the week. A template for the tabulation is shown in Table 11.2. The objects and attributes from which the displayed information is derived are shown in italics. Implementers may deviate from the layout shown provided the resulting display shows at least the information specified in the table (for example, exceptions from **NonStandardWorkingDay** may be placed in an additional column instead of a separate row, or merged into the *Notes* column).

Table 11.2 - General layout of schedules display

Operations	Days	Times	Notes
(Table sub-header, from *featureName* if present - omit this row if *featureName* is not present) Links to other unusual attributes like source and graphic can be included here.			
Normal, Closed, Unmanned OR other: abcde Attribute *categoryOfSchedule* From *ServiceHours* Date ranges *fixedDataRange*, *periodicDateRange*	(Day(s) of week) DoW (single day) OR DoW - DoW (if *dayOfWeekIsRange* = *true*) OR DoW, DoW (if *dayOfWeekIsRange* = false)	(Times of day) hh:mm–hh:mm hh:mm–hh:mm … *timeOfdayStart*, *timeOfDayEnd*	(Additional information) *complex attribute information*
(repeat *according to multiplicity of scheduleByDayOfWeek*)			
Exceptions *NonStandardWorking Day* associated to the above *ServiceHours*	(fixed and variable date(s) from *dateFixed* or *dateVariable*)		(Additional information) *complex attribute information*
(repeat both rows above, according to multiplicity of ServiceHours associated to the feature or information type)			

Notes:
(1) The "Normal, Closed, …" row represents information from **ServiceHours**, the "Exceptions" row from **NonStandardWorkingDay** associated to that **ServiceHours**.
(2) If there is more than one **ServiceHours** instance associated to the same feature or information type, the rows are repeated. This might be the case if there are different schedules for different types of operations (normal, unmanned, etc.).
(3) DoW represents *scheduleByDayOfWeek.timeIntervalsByDayOfWeek.dayOfWeek*.
(4) Times must be ordered according to the sequence of *timeOfDaystart* and *timeOfDayEnd* attributes in the dataset (this allows for encoding multiple periods in the day if needed, for example 08:00 - 12:00 and 13:00 - 17:00).
(5) The "Notes" column contains the content of the information attribute of **ServiceHours** or **NonStandardWorkingDay** (either the content of the text sub-attribute or a link to the text, as appropriate).
(6) Inclusion of the header row(s) is left to implementer discretion.
(7) Other attributes (for example, *graphic*) are not expected to be used for encoding schedule information, but if populated should be accessible via the "Notes" column or in header or trailer rows.

Since S-100 Edition 5.0.0 portrayal does not provide for specifying templates for text formatting, the implementation of tabular forms must be left to implementers for this edition. As a provisional alternative, information may be displayed in text form, with rows of Table 11.2 converted to phrases:

Normal operation: (date range) DoW-DoW, hh:mm-hh:mm, (additional information/link)
Exceptions: (fixed/variable dates), (additional information/link)

PRODUCTION STRATEGIES – DATASET CREATION

12.4 Production hints and recommended practices (informative)

12.4.1 Capturing the application of a regulation, recommendation, etc. to specified kinds of vessels

Encoders may find it easiest to capture the application of a regulation (recommendation , etc.) to a class or set of vessels in three phases:

(1) Encode the operative part of the regulation (the part that describes what the vessels subject to the regulation must or must not do), creating an instance of **Regulation** (or **Recommendation**, etc., as appropriate). Descriptions of what kinds of vessels are subject to the regulation must be excluded from the content of the **Regulation** instance.

(2) Create an **Applicability** information type and encode the description of what kinds of vessels are subject to (or exempted from) the regulation.

(3) Link the two using an **InclusionType** with *membership=included* if the vessels described by **Applicability** are subject to the regulation, or *membership=excluded* if they are explicitly exempted from the regulation.

It is not necessary to create separate instances of the regulation for inclusion and exclusion.

12.4.2 Capturing the permissibility or otherwise of a geographic feature for specified kinds of vessels

Encoders may find it easiest to capture the permissibility of a feature to specified kinds of vessels in three phases.

(1) Create the geographic feature if it does not already exist.

(2) Create an **Applicability** information type and encode the description of what kinds of vessels are required to use the geographic feature.

(3) Link the two using a **PemissionType** with *categoryOfRelationship = required*.

For the other relationships (prohibited, not recommended, etc.) steps 2 and 3 should be modified accordingly (i.e., if use by certain kinds of vessels is "not recommended" encode the description of that kind of vessels in an Applicability and create a linking **PermissionType** with *categoryOfRelationship = not recommended*).

It is not necessary to create a separate instance of the geographic feature for each type of relationship.

12.4.3 Constructing the Applicability information type

Where the source material describes complex conditions, encoders may find it useful to write out the conditions in structured language with grouping parentheses, for example, as *"(condition A) AND (condition B) AND (condition C)"*, or draw diagrams, before encoding **Applicability** and its associations.

Note that the model limitation on mixing logical connectives means some forms of conditions which use "nesting" cannot be encoded in a single **Applicability** instance and multiple instances must be created.

EXAMPLE: The complex condition "(condition A) AND ((condition B) OR (condition C))" must be encoded as two **Applicability** instances, one with "(condition A) AND (condition B)" and the other with "(condition A) AND (condition C)".

Table 12.2 - Example of conversion of complex condition to multiple simple conditions

Complex condition	Encode as
(condition A) AND ((condition B) OR (condition C))	Applicability 1: (condition A) AND (condition B) Applicability 2: (condition A) AND (condition C)

Data producers may contact NIPWG with questions about encoding complex conditions.

As a last resort, conditions may be written as phrases in natural language and encoded in the *information* attribute. It is acceptable for an **Applicability** to have only the *information* attribute populated.

CONCLUSION

- NPUBs use of associations and information types is complex.

  - Pick report-like portrayal is insufficient especially for associations.

  - Producer U/I based purely on data objects is likely to be difficult to use.

  - Other concepts are needed for both production and end-user portrayal interfaces.

- Extensions may be needed

  - Support in Product Specifications: Extensions to Application Schema, GML format, portrayal specification?

  - Support in S-100? (Feature Catalogue model, Portrayal Catalogue, GML format)

- Participation Invited!

  - Provide user perspectives in identifying current problems and needs

  - Review recommendations for documentation and product specifications

  - Send input and questions to Raphael Malyankar