Vertical and horizontal clearances: New complex attributes appear to be messy. Similar to the situation that was discussed regarding fixed and periodic dates, vertical clearances in particular result in illogical types of clearance (vertical open, vertical closed, vertical safe) being available for features. Suggest reverting back to dedicated attributes (complex consisting of value and accuracy sub-attributes) be investigated.

HORIZONTAL CLEARANCE FIXED COMPLEX ATTRIBUTE

Horizontal clearance fixed			C	0,1
Clearance value horizontal	(HORCLR)		(S) RE	1,1
Horizontal distance uncertainty	(HORACC)		(S) RE	0,1

HORIZONTAL CLEARANCE OPEN COMPLEX ATTRIBUTE

Horizontal clearance open			C	0,1
Clearance value horizontal			(S) RE	1,1
Horizontal distance uncertainty	(HORACC)		(S) RE	0,1

HORIZONTAL CLEARANCE CLOSED COMPLEX ATTRIBUTE

Horizontal clearance closed			C	0,1
Clearance value horizontal			(S) RE	1,1
Horizontal distance uncertainty	(HORACC)		(S) RE	0,1

COMPLEX ATTRIBUTE DESCRIPTIONS

Horizontal clearance closed

Comment [A1]: I have included this but I don't know if it makes sense. Needs Use Case.

Horizontal clearance closed: IHO Definition: The horizontal clearance measured between …… in the closed position.

Indication: The complex attribute encodes the horizontal distance …….

Sub-attributes: **Clearance value horizontal**   see clause X.X
                Horizontal distance uncertainty   see clause X.X

Remarks:
- No remarks.

Horizontal clearance fixed

Horizontal clearance fixed: IHO Definition: The horizontal clearance measured between …… for a fixed span.

Indication: The complex attribute encodes the horizontal distance …….

Sub-attributes: **Clearance value horizontal**   see clause X.X
                Horizontal distance uncertainty   see clause X.X

Remarks:
- No remarks.

Horizontal clearance open

Horizontal clearance open: IHO Definition: The horizontal clearance measured between …… for an opening span.

Indication: The complex attribute encodes the horizontal distance …….

Sub-attributes: **Clearance value horizontal**   see clause X.X
                Horizontal distance uncertainty   see clause X.X

Remarks:
- No remarks.

SUB-ATTRIBUTES

Clearance value horizontal

Clearance value horizontal: IHO Definition: The width of an object, such as a canal or a tunnel, which is available for safe navigation. This may, or may not, be the same as the total physical width of the object.. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.137, November 2000).

Unit: Defined in the HUNI subfield of the CRSH record: metre (m)

Resolution: 0·1m

Format: xx.x

Example: **125** for a horizontal clearance of 125 metres

Remarks:
- No remarks.

Horizontal distance uncertainty

Horizontal distance uncertainty: IHO Definition: The best estimate of the horizontal accuracy of horizontal clearances and distances. (S-57 Edition 3.1, Appendix A – Chapter 2, Page 2.136, November 2000).

Unit: Defined in the HUNI subfield of the CRSH record: metre (m)

Resolution: 0·1m

Format: xx.x

Example: **0.5** for an error of 0·5 metres.

Remarks:
- The expected input is the radius of the two-dimensional error.
- The error is assumed to be positive and negative. The plus/minus character must not be encoded.

ADDITIONAL COMMENTS

- **horizontal clearance fixed** should only be used for permanently fixed clearances e.g. between bridge spans, or in a canal or lock basin, **horizontal clearance open** should only be used for features such as gates.

- **horizontal clearance closed** has only been included in this proposal for completeness. Do not consider there would be any such requirement for this attribute (i.e. there would be no horizontal clearance if a feature such as a gate was closed. Needs a Use Case.