

Paper for Consideration by ENCWG VTC1

IC-ENC Discussion Items

Submitted by:	IC-ENC
Executive Summary:	This paper presents two items identified by IC-ENC where S-58 7.0.0 could be improved.
Related Documents:	S-58 DRAFT 7.0.0
Related Projects:	-

Introduction / Background

1. This paper presents two items for the ENCWG to consider for inclusion in S-58 7.0.0 both items would require changes to the associated S-58 Test Datasets. But only item 1 impacts the S-58 document itself. IC-ENC has also commenced work to make edits to the S-58 test datasets to reflect 7.0.0 and wishes to make the ENCWG aware of this.

Item 1 – Modification of check 77 logic

2. IC-ENC sees many instances of the Critical check 77 reporting when one depth contour touches another at a single node. They do not cross in the normal sense but given that the CROSSES operator included in S-58 includes the scenario where they meet at an interior point they do cross as defined in the standard. IC-ENC still reports these instances for improvement action but given the impact feels they should not be Critical as this may unduly delay data release.

“CROSSES – *The intersection of geometric object **a** and geometric object **b** returns geometry with a dimension less than the largest dimension between **a** and **b** but is not the same as geometric object **a** or **b**.*

Two LineStrings cross each other if they meet on an interior point. A LineString crosses a Polygon if the LineString is partly inside the Polygon and partly outside.

The definition of CROSSES is:

$$\mathbf{a.Cross(b)} \Leftrightarrow (I(\mathbf{a}) \cap I(\mathbf{b}) \neq \emptyset) \wedge (dim(I(\mathbf{a}) \cap I(\mathbf{b})) < \max(dim(I(\mathbf{a})), dim(I(\mathbf{b})))) \wedge (\mathbf{a} \cap \mathbf{b} \neq \mathbf{a}) \wedge (\mathbf{a} \cap \mathbf{b} \neq \mathbf{b})$$

*This translates to: **a** crosses **b** if the intersection of the interiors of **a** and **b** is not the empty set AND the dimension of the result of the intersection of the interiors of **a** and **b** is less than the largest dimension between the interiors of **a** and **b** AND the intersection of **a** and **b** does not equal either **a** or **b**.*

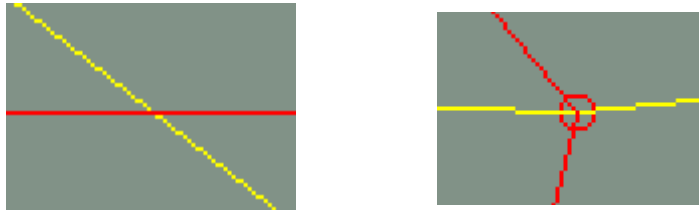
Note that “ $(I(\mathbf{a}) \cap I(\mathbf{b}) \neq \emptyset) \wedge$ ” was added to the beginning of the ISO 19125-1:2004 formula so that it would not be true for disjoint geometry.

The CROSSES operator only applies Line/Line and Line/Area relationships.”

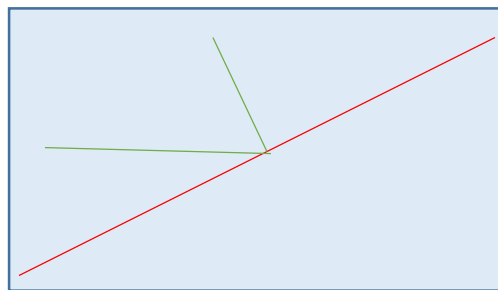
3. IC-ENC considers there to be two scenarios one where the contours cross and another where they share a

single interior node. IC-ENC therefore proposes a change to check 77 so that the second scenario is no longer reported. This logic is not possible to describe using the existing ISO 19125 operators so amended language is proposed.

Scenario 1 genuine crossing case two-line segments cross either at a vertex or node or without either



Scenario 2 case where contours touch at a single node and only cross as defined by the CROSSES operator



Current check 77 (S-58 7.0.0 Redline 2)

77	For each DEPCNT feature object which CROSSES another DEPCNT feature object.	DEPCNT objects cross.	Amend DEPCNT objects so they do not cross.	Logical consistency	C
----	---	-----------------------	--	---------------------	---

Proposed change to check 77 Option A

77	For each DEPCNT feature object which CROSSES another DEPCNT feature object. <i>Instances where the point of intersection is an intermediate vertex or node, and where one DEPCNT doesn't cross to the other side of the other DEPCNT, are excluded.</i>	DEPCNT objects cross.	Amend DEPCNT objects so they do not cross.	Logical consistency	C
----	---	-----------------------	--	---------------------	---

Item 2 – Clarification of check 7

4. IC-ENC is increasingly receiving ENC data where producers are producing ENC data which contains features with agency codes of another producer. A number of validation tools report errors in this scenario related to S-58 check 7. These errors highlight that the AGEN in the FOID differs from that in the DSID field. Discussions with the S-58 sub group lead concluded that invalid pertains specifically to the value itself and not its consistency with other values within the dataset. Therefore it is considered that such differences should not report check 7.

7	For each feature object with invalid AGEN, FIDN or FIDS values.	Invalid values of AGEN, FIDN or FIDS.	Amend AGEN, FIDN or FIDS value.	Part 3 (4.3.1) and (4.3.2)	C
---	---	---------------------------------------	---------------------------------	----------------------------	---

5. IC-ENC therefore proposes that an additional test dataset is included to provide clarity on when this critical error should report. The test dataset simply needs to contain an object with a FOID where the AGEN differs from the DSID value the check should not report this scenario (negative case).

Recommendation

6. IC-ENC invites the ENCWG to consider these items to ensure that the S-58 checks are as clear as possible. This will support consistent implementation in validation tools and application by producers and RENCs.

Action Required of ENC WG

The ENCWG is invited to:

- a. Consider the change proposed to check 77. And if supported make consequential changes to the associated test datasets to reflect this.
- b. Consider the expansion of the S-58 test dataset to cover the clarification above for check 1518a.