



# 13<sup>th</sup> Meeting of the WENDWG

## Presentation by USA (NGA)

### Mitigating Navigational Risk Involving Overlapping ENCs with Inverse Band-Scale Relationships

#### Agenda Item 10.1A



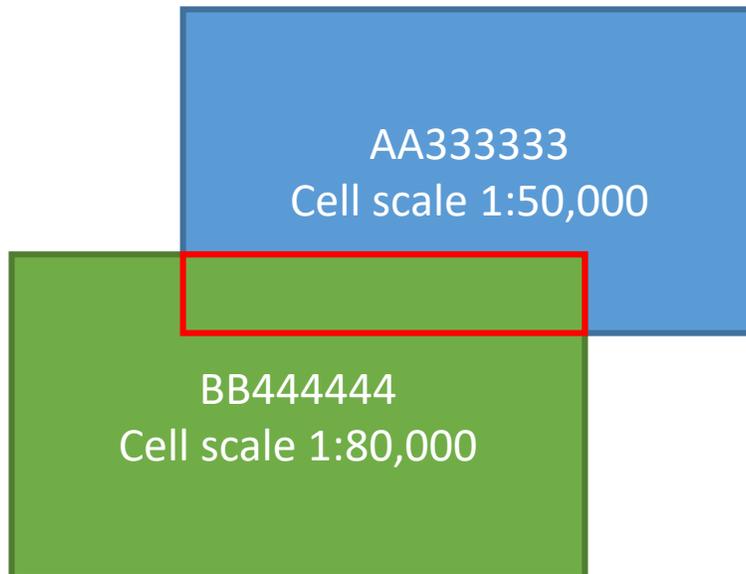
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# INTRODUCTION/BACKGROUND

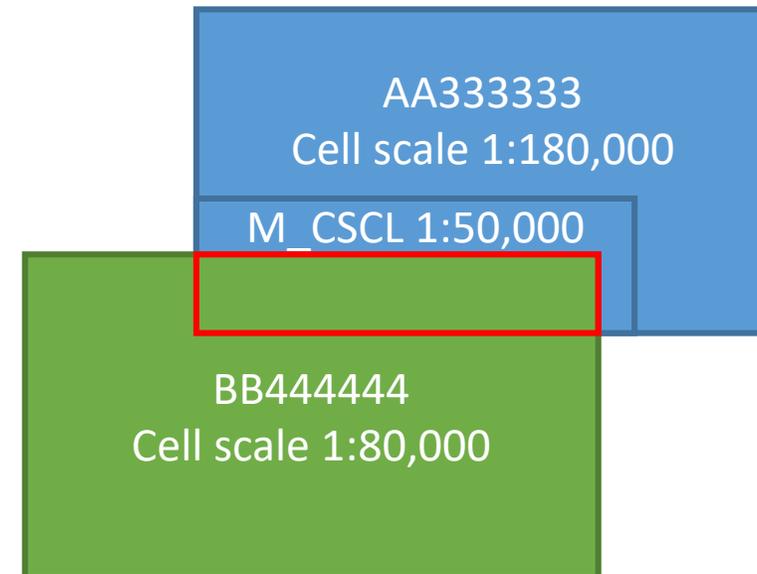
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- NGA has become aware of a new ENC overlap scenario affecting some ECDIS
  - Issue where “inverse” relationship exists between navigation purpose and compilation scale of overlapping cell coverages
  - Typically involves two producers and can fit two scenarios:

*Scenario 1: Best data available indicated by cell compilation scale*



*Scenario 2: Best data available indicated by inset M\_CSCL scale*



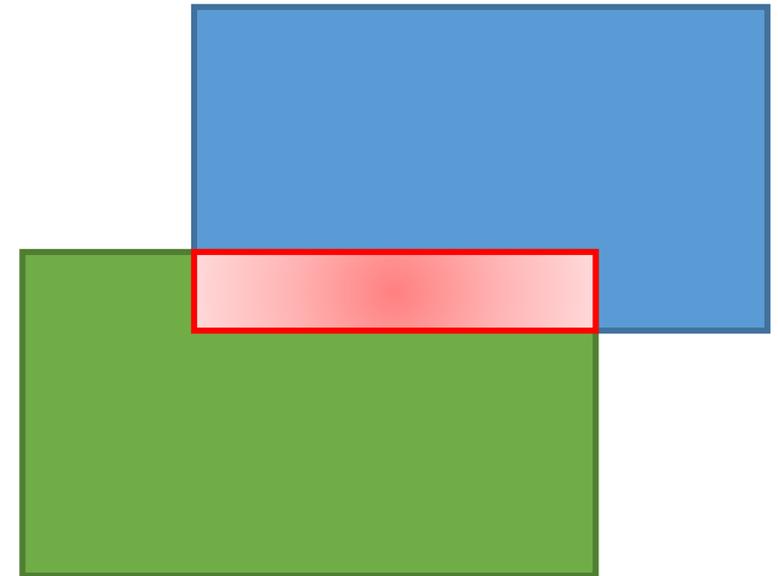


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# INTRODUCTION/BACKGROUND

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- Can lead to unpredictable ECDIS behavior on ECDIS *which prioritize Navigational Purpose over Compilation Scale*
  - May fail to provide alarms or display chart information from largest-scale data in overlap area
  - May ignore best-scale chart information, display both datasets, or other undesired behavior
  - Behavior confirmed to NGA by its customers using two different ECDIS





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# ANALYSIS OF STANDARDS

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NGA believes this could impact other ECDIS after review of relevant standards

- *IMO Revised Performance Standards for ECDIS & IEC 61174*, ENC prioritization and interaction is not clearly prescribed
  - Requires using “largest scale” for alarms, and indication if ship’s position is covered by ENC at a “larger scale” than displayed
  - No specifics on how ECDIS logic should account for compilation scale vs. Navigational Purpose – “largest scale” *could* be inferred by NP
- *S-52* calls for a data overlap indicator where cells of different navigational purposes overlap
  - Different navigational purpose overlaps are routine in likely every scheme
  - No indication to specifically depict overlap issue at hand – likely not obvious to user that this is occurring
- Not addressed in *S-57* specification, tests in *S-58*, nor test datasets in *S-64*



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# DISCUSSION ON DATA FINDINGS

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NGA also performed initial analysis on cells within IHO ENC Coverage Catalogue

- Detected over 900 cells with this type of overlap in catalogue footprints as of 2 December 2022
- Analysis was limited to finding Scenario 1 overlaps (best data available indicated by cell compilation scale)
  - Additional overlaps are likely from Scenario 2 (best data available indicated by inset M\_CSCL scale)
  - Scenario 2 analysis was not possible as M\_CSCL is not available as an ENC Coverage Catalogue layer



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# CONCLUSIONS

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- Unknown how many ECDIS are affected or what behavior may result
  - Both investigated by NGA were confirmed; standards appear to leave room for more
- Inverse scale/purpose overlap scenarios exist in over 900 ENC's (as of Dec 2022)
- Almost exclusively occurring between two different producers
  
- Similar to, but not included in, overlap cases under IHO Resolution 1/2018:
  - *“It has been reported that overlapping ENC data, when used in ECDIS equipment, may lead to unpredictable behaviour in at least the following cases: overlapping data occurring in the same usage band (Navigational Purpose); overlapping data occurring in ENC cells in different usage bands (Navigational Purposes) but using the same compilation scale...”*



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# JUSTIFICATION AND IMPACTS

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- The justification for this recommendation is the need for mariners using ECDIS to experience alarms and visualization for all hazards to navigation, particularly those available in the largest-scale ENC products. Failure to do would cause a clear negative impact on safety of navigation.
- Secondly, one may also consider the impact on resources spent by ENC Producers.
  - It is feasible that producers are currently providing and maintaining coverage when desired coverage exists within an unexpected navigational purpose, or providing coverage which users on some ECDIS may never see.



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# ACTIONS TO BE CONSIDERED BY THE WENDWG

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The WENDWG is invited to consider the following actions:

- Endorse the need for further investigation into risk presented by this new overlap case.
- Engage as appropriate with the ENCWG to conduct further investigation into prevalence of affected ECDIS/OEMs.

*Potentially pending outcome of investigation...*

- Recommend amendment to IHO Resolution 1/2018 to include this additional overlap case.
- Recommend that RHCs, possibly with RENC assistance, track and report on progress resolving these overlaps.