

**21<sup>st</sup> IHO-TSMAD Meeting  
Victoria, Canada, 29<sup>th</sup> November - 3<sup>rd</sup> December 2010**

**Paper for Consideration by TSMAD**

**Use of Offset coordinates in S-101**

<b>Submitted by:</b>	UKHO
<b>Executive Summary:</b>	This paper considers different approaches to storing coordinates in S-101 which would reduce ENC data volume. This paper suggest TSMAD consider these approaches.
<b>Related Documents:</b>	1. S-100
<b>Related Projects:</b>	1. S-101

### **Introduction / Background**

1. A primary benefit of ENCs and one of the premises of the argument for digital navigation is that ENCs can be updated more easily than paper charts. As digital products do not have the physical limitations of paper products it should also be possible to update them more quickly, frequently and while a vessel is underway. With the advent of marine satellite broadband remote updating becomes a possibility, however due to the cost of data downloads the volume of ENC data currently prohibits this for most vessels. Different approaches to storing geographic coordinates could be used in S-101 in an effort to reduce data volume.

### **Analysis/Discussion**

2. One approach which has the potential to significantly reduce ENC file size for S-101 ENCs is coordinate differencing. This process converts the geographical position to a relative position either using a single origin. Variations on this approach include coordinate normalization where the minimum bounding rectangle of the dataset is given the limits 0,0- 1,1 then all positions can be given using fractions. Initial investigation suggests this approach can reduce data volume by 10-20%.

3. An alternative approach would be to difference on each line. With this approach the absolute geographic position would be encoded on the start point with all other vertices stored relative to the start point. This approach would add complications to the load process and updating would be affected.

### **Conclusion**

4. Research suggests there are alternative approaches to coordinate encoding which would significantly reduce data volume. These should be considered for S-101 to ensure the new 8211 encoding is as efficient as it can be. It is noted that DGIWG have examined these approaches and may have experience to share on this subject. See document below;

[DGIWG – 303b Geography Mark-up Language \(GML\) Application Schema for the Multinational Geospatial Co-production Program \(MGCP\)](#)

### **Action Required of TSMAD**

- Consider the alternative approaches to coordinate encoding laid out in this paper and discuss investigating them further.