SUBJECT: Penobscot Maine DGPS Site Operational Assessment

DATE: 5-7 April 2011

INSPECTOR: LT Bion Holbrook

PURPOSE: Validate advertised DGPS coverage of the Penobscot DGPS site. Validate required RTCM message delivery. Test differential correction accuracy versus a predetermined survey monument.

EQUIPMENT: DNAV 212 INVICTA Receiver
Hemisphere R110 GPS Receiver
MBA-2 Receive Antenna

PARAMETERS:

Frequency	290 KHz
Forward Output Power	800W
Transmission Rate	200 baud
Field Strength/Range	100µV/m at 435 km

SITE PHOTO:

RESULTS

Signal Strength:

DNAV readings were from the Penobscot DGPS site on both east and west points of coverage spanning from Rhode Island to Canada, respectively. At all points, the signal strength and signal-to-noise ratio (SNR) were satisfactory in meeting the advertised coverage. Additionally, the measured coverage closely matches the predicted coverage plot of Penobscot. In figure 1 below, the range ring is set to the 435 km advertised range. Green points represent areas of satisfactory signal strength and SNR, while red points represent areas of unsatisfactory signal strength or SNR.

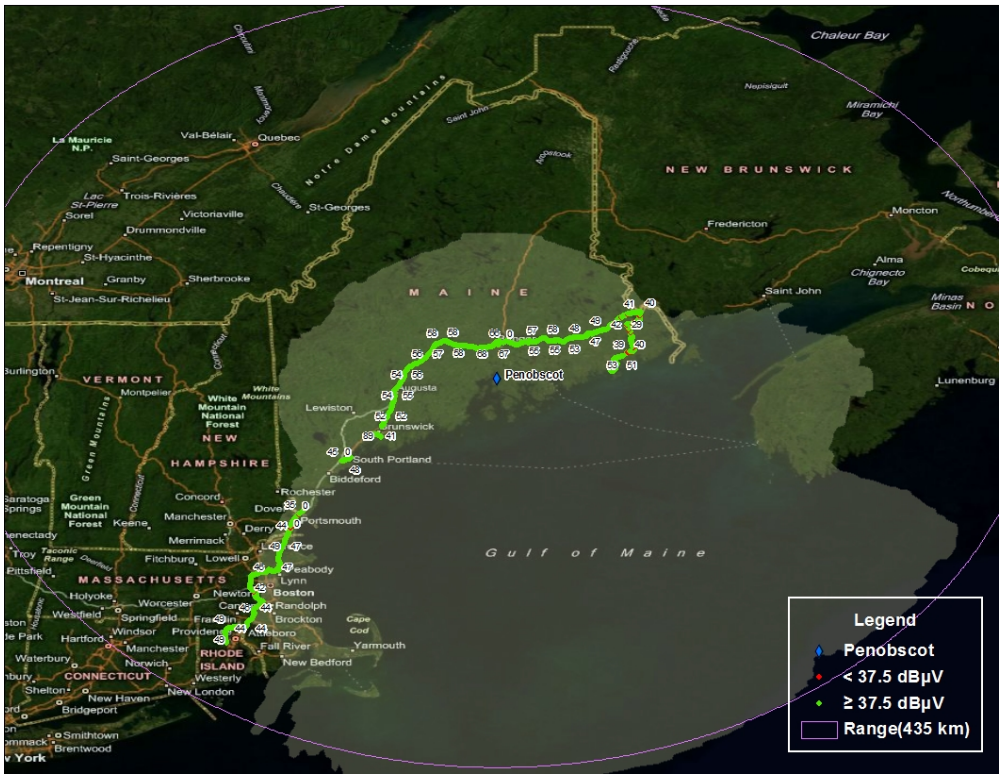

Figure 1.

Near-Field Signal Strength Reading 1: Side A

Receiver:	DNAV 212 INVICTA
Antenna:	MBA-2
Position	44º 31.168'N 068º 44.973'W
Signal Strength	81dBµV/m
SNR	18

Near-Field Signal Strength Reading 2: Side B

Receiver:	DNAV 212 INVICTA
Antenna:	MBA-2
Position	44º 31.168'N 068º 44.973'W
Signal Strength	81dBµV/m
SNR	17

RTCM Message Verification:

RTCM message were collected from both sides of the DGPS site utilizing a Hemisphere R110 Receiver. All required message traffic was confirmed. A Type 5 message was observed while recording Side B.

Side A

Type 3	X
Type 7	X
Type 9	X
Type 16	N/A
Misc	N/A

Side B

Type 3	X
Type 7	X
Type 9	X
Type 16	N/A
Misc	Observed Type 5

Accuracy Validation:

Data was collected for 15 minutes on each side. Positional data was then averaged and compared to the actual monument position to check the horizontal accuracy of the correction.

NGS Monument ID:	**PE1746**
Monument LAT:	44° 32’ 21.82593”N
Monument LON:	-68° 26’ 34.62718” W

Side A

Averaged LAT:	44° 32' 21.8214" N
Averaged LON:	-68° 26' 34.6194"W
Distance from DGPS Site:	27.8km
Distance from Monument:	0.22 m (.73 feet)
Bearing from Monument:	290.47º

Side B

Averaged LAT:	44° 32' 21.768" N
Averaged LON:	-68° 26' 34.6524"W
Distance from DGPS Site:	27.8KM
Distance from Monument:	1.87 m (6.15 feet)
Bearing from Monument:	290.47º

OPERATIONAL RECOMMENDATION: Analysis of coverage is consistent with current OPORDER and predicted coverage plot.