



# Verification Procedure & Results Document No.: 3167-20107 rev A

<b>Test Case ID:</b> 007, Ver-CG-74	<b>Test Case Name:</b> VE-CG-3100 Post-recovery Evaluation, Southern Pacific Bight	<b>Test Plan Document No.:</b> 3167-20000	<b>Test Plan Rev.:</b> 2-00	<b>Test Date:</b>
<b>Test Director</b> (Print Name) Ed Dever	Signature in lieu of electronic signature	<b>Design Engineer</b>	Approval Signature John S. Dingess in lieu of electronic signature	Date 10-11-2012
<b>Test Conductor</b> (Print Name) David Neiman	Signature 	<b>System Engineer</b>	Approval Signature Ed Dever (in lieu of electronic signature)	Date 10/15/2012
<b>Witnessed by</b> (Print name)	Signature	<b>QA/QC Engineer</b>	Approval Signature	Date

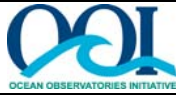
<b>Test Class</b>	<input checked="" type="checkbox"/> Performance	<input checked="" type="checkbox"/> Behavioral	<input type="checkbox"/> Reliability	<input type="checkbox"/> Endurance / Longevity	<input type="checkbox"/> Survivability	<input type="checkbox"/> Safety
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**Test Description**  
The glider power and data usage will be evaluated against OOI requirements for deployment endurance. Allowances for data and power usage by the modem, extrapolated to a 1-year deployment, will be made in calculating endurance.

**Requirements Addressed**  
L4-CG-GD-RQ-135, L4-CG-GD-RQ-138, L4-CG-GD-RQ-82, L4-CG-GD-RQ-76, L4-CG-GD-RQ-157, L4-CG-GD-RQ-86, L4-CG-GD-RQ-91, L4-CG-GD-RQ-147, L4-CG-GD-RQ-87, L4-CG-GD-RQ-137

<b>Test Setup</b> Glider flight documentation	<b>Test Artifacts</b> This document Power consumption records for deployment
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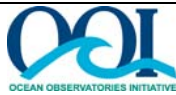
Test Procedure				Test Results		
Step No.	Instructions	Expected Results (Accept Criteria)	Requirement ID	Test Data	Pass/Fail	Notes/Waiver No.
7.1	Evaluate power consumed during prototypical open-ocean glider operation	Open-ocean gliders will have a deployment interval of twelve months.	L4-CG-GD-RQ-135			
7.2	Evaluate total deployment time (as determined by available power) to determine glider range during deployment	Over the deployment interval, open-ocean gliders will have a minimum horizontal range through the water of 6300 kilometers.	L4-CG-GD-RQ-138			This requirement is based on constant 20cm/s forward speed over the full year.



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Test Procedure				Test Results		
Step No.	Instructions	Expected Results (Accept Criteria)	Requirement ID	Test Data	Pass/Fail	Notes/Waiver No.
7.3	Evaluate the ability of the on-board power to maintain full functionality over the entire deployment interval.	Open-ocean gliders will have sufficient power to operate the controller with full functionality for the required deployment interval.	L4-CG-GD-RQ-82			Ensure that glider can operate normally during the full deployment interval.
7.4	Evaluate the ability of the glider to meet a 60-day low power emergency operation.	The open-ocean glider will have sufficient battery reserves to allow the open-ocean glider controller, GPS location system, and telemetry system to remain functional for 60 days following the end of the planned deployment interval.	L4-CG-GD-RQ-76			A low-power emergency mode was developed for the coastal glider that allowed 60-day limited operation (at surface, 1/day communications) using 36A-hr. This is 3.5% of the open-ocean glider power capacity.
7.5	Evaluate the power required to operate the modem. This will require some assumptions about modem usage (transmit/receive, etc.). Use the SM75 results for transmission efficiency.	Open ocean gliders mounting acoustic modems will have sufficient energy to transfer a total of 15 megabytes via the acoustic link during the deployment interval.	L4-CG-GD-RQ-157			An estimate of the power required is needed for this verification.
7.6	During this deployment, several navigation parameters will be used. Routine use of the open-ocean glider calls for station-keeping in the face of a 20cm/s current. For this requirement, conditions that would allow the glider to maintain a constant average speed of 20cm/s will be evaluated for power usage.	The horizontal component of the velocity of the open ocean glider relative to the water will be a minimum of 20 cm/s when averaged over the vertical extent of each complete dive cycle.	L4-CG-GD-RQ-86			



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Step No.	Instructions	Expected Results (Accept Criteria)	Requirement ID	Test Data	Pass/Fail	Notes/Waiver No.
7.7	Evaluate the data storage needed for the full deployment interval, excluding .dbd files.	The data storage subsystem will have data storage capacity to store all of the open-ocean glider engineering and sensor data collected during a deployment interval	L4-CG-GD-RQ-91			The glider .mbd list will be set to capture the non-NaN columns of the .dbd file, as the .dbd file is sensitive to deletion as the engineering disk fills.
7.8	Compare data storage required for the deployment, scaled to 1 year, to the 2GB per Persistor card. The acoustic modem power requirement (L4-CG-GD-RQ-157) states that 15MB total is expected for transfer, so add 15MB to the data storage used on the card that stores modem data.	The open ocean glider data storage subsystem will have data storage capacity to store all of the data obtained from remote instruments via the acoustic modem in addition to that stated in the Glider Common Requirements.	L4-CG-GD-RQ-147			
7.9	Evaluate re-deployment ability following refurbishment.	Open-ocean gliders will be recoverable and reusable following refurbishment and refueling.	L4-CG-GD-RQ-87			
7.10	Compare forward speed calculated to verify L4-CG-GD-RQ-86 to 20cm/s requirement.	Gliders will have sufficient range to stay in a fixed geographical location for the deployment interval when confronted with a steady ocean current of 20 cm/s.	L4-CG-GD-RQ-137			