Verification Procedure & Results

Test Procedure Document No.: **3166-80104**	Test Procedure Rev.: **1-00**

Test Case Name:		Test Plan Document #	Test Plan Rev.:	Test End Date:
Coastal Wire Following Profiler Mooring - End to End Demonstration		**3166-80000**	**1-02**	

Test Conductor (Print Name)	Signature	Design Engineer (Print Name)	Approval Signature	Date
		Michael Eder	in lieu of signature Michael Eder	6/14/13
Test Director (Print Name)	Signature	System Engineer (Print Name) Sheri N. White	Approval Signature	Date 2014-04-22
Witnessed by (Print name)	Signature	QA/QC Engineer (Print Name) Gary Cook	Approval Signature	Date 2014-04-22
DOORS Verification Procedure ID **Ver-CG-183**	DOORS Verification Event ID **CG-VE-3082**	Test Results Reviewed	QA:	Date
				Date

Test Description

The active components (buoy, profiler, ADCP and interconnecting cables) of the CP01PMCI Pioneer Central Inshore Mooring will be interconnected and the mooring powered by an external power supply. The mooring will be placed outside to allow clear view of the sky for satellite communications. WiFi, Freewave, Iridium and GPS devices will be connected, along with the profiler. The 3DMGX3 and RTE engineering sensors and the ADCPT instrument will also be connected. The profiler will be set up to run a profiler every 1 hour. At 1 hour intervals, checks will be made to verify the mooring awakens on the periodic intervals specified in the mission configuration file, log files are generated on the computational element, and files are being properly transferred to the shore server via the Iridium-ISU. The system will be run for 24 hours, and a check made to verify the first time a connection is made after midnight, the syslog file is transferred to the "shore server".

In addition, a new mission configuration file will be placed on the shore server and and checks performed to ensure new missions can be downloaded and executed by the mooring.

The following mission configuration file will be utilized during the test, as follows:
-test183A_Mission.cfg will set irid, fwwf, gps on and sbd off; initialize both the imm port (#2) and 3dmgx3 port (#5) to be on for 30 minutes each hour; set gps as the pps_source.
-test183B_Mission.cfg will set irid, fwwf, gps on and sbd off; initialize the imm port (#2) to be on for 30 minutes each hour; set 3dmgx3 port (#5) to be off; set gps as the pps_source

Requirements Addressed

L4-CG-PC-RQ-75:   Platform Controllers shall be capable of initiating communications based on a predefined schedule.
L4-CG-PC-RQ-76:   Platform Controllers shall be capable of autonomous operation based on one or more predefined missions.
L4-CG-PC-RQ-625: Platform Controllers shall be capable of establishing communications with instruments on a mooring to obtain measurement data.
L4-CG-PC-RQ-628: Platform Controllers shall log data from scientific instruments on the mooring.
L4-CG-PC-RQ-635: Platform Controllers shall provide the capability to compress or decimate recorded data.
L4-CG-PC-RQ-691: WHOI Platform Controllers shall support low-speed satellite communication capability.
L4-CG-PC-RQ-727: Platform Controllers shall provide the capability to accept mission control from the OMC.
L4-CG-PC-RQ-732: Platform Controllers shall have the capability to send platform status and data to the OMC over a telemetry link.
L4-CG-PC-RQ-738: Platform Controllers shall provide data logging capabilities for engineering sensors.
L4-CG-PC-RQ-749   WHOI Platform Controllers shall be capable of shutting down unneeded functions to conserve power while maintaining scheduled data collection tasks.
L4-CG-PC-RQ-775   Platform Controllers shall support remote operation, configuration, status reporting and scientific data retrieval when communicating via an available telemetry device for that purpose.
L4-CG-PC-RQ-793: Platform Controllers shall monitor and record data/status from telemetry components.
L4-CG-PC-RQ-801: The Platform Controller CE shall log all acquired status information.
L4-CG-PC-RQ-833: WHOI Platform Controllers shall interface to radio telemetry components per ICD 3102-10001.
L4-CG-PC-RQ-835: Platform Controllers shall communicate bi-directionally with Wire-Following Profilers per ICD 3102-10003.
L4-CG-PC-RQ-840   Platform Controllers shall support an inductive bi-directional communications capability interface to communicate with assets on the mooring not electrically connected to the controller.
L4-CG-PC-RQ-865: Platform Controllers shall be capable of transmitting platform status information to the OMC via any available telemetry channel.
L4-CG-TS-RQ-195: Inductive telemetry systems shall interface to mooring riser components.
L4-CG-TS-RQ-199: Telemetry components shall transmit data/status to Platform Controllers.
L4-CG-PR-RQ-378: The Wire Following Profiler sub-system shall make data availble to the OMS data server.

L3-CG-RQ-163: CGSN platforms shall transmit data to shore.
L3-CG-RQ-164: CGSN platforms with telemetry links shall receive commands and status from CGSN shore-based assets.
L3-CG-RQ-292: Wire-Following Profiler Moorings shall be capable of transmitting a subset of the data collected to shore.
L3-CG-RQ-293: Wire-Following Profiler moorings shall include a long-range bi-directional communications capability.
L3-CG-RQ-294: Wire-Following Profiler moorings shall include a short-range (line-of-sight) Ethernet-based bi-directional communications capability.
L3-CG-RQ-599: Wire-Following Profiler moorings shall include an inductive telemetry link for transmission of data, commands and status to subsea resources not electrically connected to the mooring.
L3-CG-RQ-761: CGSN platforms shall be capable of having their sampling or operational protocols changed remotely via CGSN assets.
L3-CG-RQ-871: Wire-Following Profiler moorings shall include a short-range (line-of-sight) RF-based bi-directional communications capability.
L3-CG-RQ-890: CGSN platforms without a CI presence and without sufficient bandwidth for real-time transfer of raw data, shall compress or decimate data.
L3-CG-RQ-1002: CGSN platforms with telemetry links shall be capable of initiating communications to shore.

Test Setup

The active components (buoy, profiler, ADCP and interconnecting cables) of the CP01PMCI Pioneer Central Inshore Mooring will be interconnected and the mooring powered by an external power supply. The mooring will be placed outside to allow clear view of the sky for satellite communications. WiFi, Freewave, Iridium and GPS telemetry devices will be connected. The profiler will be set up to run a profiler every 1 hour. The 3DMGX3 and RTE engineering sensors and the ADCPT instrument will be connected. An operational "shore server" computer will be used that is capable of communication with the mooring. A test computer (e.g., laptop PC) will be used to communicate with the mooring and shore server, and will be used to validate the processing of new missions within the mooring:
1) The RFM interface will be used to login to the STC computational element in order to set new configuration files.
2) The WiFi interface will be used to monitor updates to the data files for instruments attached to the profiler.
3) The buoy's internal webserver will be used to display status files that have been logged to the computational element.

Required equipment:
CP01PMCI Pioneer Central Inshore Mooring (refer to document# 3604-00010) with following active components:
   -- buoy, profiler, ADCP and interconnecting cables.
External power supply - capable of providing 19 +/- 1 VDC having at least a 1A output capacity connected to the buoy external power connector (J112)
Telemetry devices - GPS, Iridium ISU, SBD, Freewave, WiFi
Engineering sensors - 3dmgx3, RTE
Scientific instruments - ADCP
Test computer - (e.g., laptop PC) equipped with the following:
   -- RFM Master in a serial port
   -- SSH Program (Putty)
   -- Freewave RF Modem
   -- WiFi interface
   -- 1 USB and 1 ethernet port
"Shore Server" test computer equipped with the following:
   -- cgsn_send_sbd test utility software

Test Artifacts

Test Artifacts consist of the Pass/Fail results for steps contained within this procedure.

The configuration files used during this test are:
test183A_Mission.cfg
test183B_Mission.cfg

The following log files captured during this test:
/data/cg_data/syslog/syslog.log
/data/cg_data/syslog/cpm_status.txt

/data/cg_data/syslog/dcl_status.txt
/data/cg_data/superv/yyyymmdd.superv.log
/data/cg_data/gps/yyyymmdd.gps.log
/data/cg_data/3dmgx3/yyyymmdd_hhmmss.3dmgx3.log
/data/cg_data/irid/yyyymmdd.irid.log
/data/cg_data/imm/adcp/adcp_yyyymmdd_hhmmss.DAT
/data/cg_data/imm/mmp/Cxxxxxxx.DAT
/data/cg_data/imm/mmp/Exxxxxxx.DAT
/data/cg_data/imm/mmp/Sxxxxxxx.DAT

Test Procedure 3166-80104 Rev 1-00				Test Results		
Step#	Instructions	Expected Results	Requirement ID	Observed Results	Pass/Fail	Notes
1	Record the software and firmware versions being used for the test.	TBD				
2	**Connect external power supply to the buoy.** **Connect devices, instruments and sensors.** **Connect the profiler.**					
3	Power on the buoy (external power) and remove the magnet.	Buoy performs a cold boot.				
4	On the PC, open the internet browser and connect to the following: http://192.168.0.51/cg-bin/view_syslog	The buoy's internal webserver is displayed.				
5	On the PC, open an SSH buoy window by double-clicking the "**PuTTY-SSH buoy**" icon and log in as "root".	An SSH buoy window opens.	L3-CG-RQ-294			
6	On the PC, open an RFM console window by double-clicking the "**PuTTY-RFM console**" icon and log in as "root".	An RFM console window opens.	L3-CG-RQ-871			
7	**Use test183A_Mission.cfg and test_DefaultSerial.cfg files** (test183A_Mission.cfg will set irid, fwwf, gps on and sbd off; initialize both the imm port (#2) and 3dmgx3 port (#5) to be on for 30 minutes each hour; set gps as the pps_source)					
8	In the RFM console window, save the current configuration files, and then copy the default serial configuration file to stc_serial.cfg and test183A mission file to stc_mission.cfg as follows: cd /data/cg_data/cfg_files cp stc_mission.cfg save_stc_mission.cfg cp stc_serial.cfg save_stc_serial.cfg cp test_proc/test183A_Mission.cfg stc_mission.cfg cp test_proc/test_DefaultSerial.cfg stc_serial.cfg					
9	From the PC, log in to the profiler setup software, and set up to run a profile every 1 hour.					
10	On a PC, login to the "shore server".					
11	On the buoy webserver, click on the **View->SerialCfg** tab to open the /data/cfg_files/stc_serial.cfg file.	Verify the following baud rates (per ICD 3102-100010): SBD = 19200 baud Freewave = 115200 baud GPS = 4800 baud ISU = 19200 baud	L4-CG-PC-RQ-833			
12	In the RFM console window, put the buoy in a "sleep" state by using the ucmd utility to send the following to the Master PIC: cd current bin/ucmd _goto_sleep quit	Text is written to the STC login window, indicating the console (linux) is shutting down.	L4-CG-PC-RQ-749			
13	At 1 hour from start, verify the buoy "wakes up".	Text is written to the STC login window, indicating the console (linux) is starting.	L4-CG-PC-RQ-76			

	Test Procedure 3166-80104 Rev 1-00			Test Results		
Step#	Instructions	Expected Results	Requirement ID	Observed Results	Pass/Fail	Notes
14	On the buoy webserver, click on the **Syslog->3DM** tab to open the **yyyymmdd_hhmmss.3dmgx3.log file**.	Verify time-tagged entries are displayed, and the times coincide with the scheduled "wake" times for port 5 as defined in the mission file.	L4-CG-PC-RQ-738 L4-CG-PC-RQ-801			
15	On the buoy webserver, click on the **View->CPM** tab to open the **/data/cg_data/syslog/cpm_status.txt** file.	Verify the status is displayed and contains the following. MPIC.hotel=… **ir 1** 12.0 <curr> <err> **fwwf 1** 12.0 <curr> <err> **gps 1 sbd 0 pps 0** …	L4-CG-PC-RQ-801			
16	On the buoy webserver, click on the **View->DCL** tab to open the **/data/cg_data/syslog/dcl_status.txt** file.	Verify the status is displayed and contains the following. **…** **DCL.port.1 = 0 ….** **DCL.port.2 = 1 ….** **DCL.port.3 = 0 ….** **DCL.port.4 = 0 ….** **DCL.port.5 = 1 ….** **DCL.port.6 = 0 ….** **DCL.port.7 = 0 ….** **DCL.port.8 = 0 ….** **….**	L4-CG-PC-RQ-801			
17	On the buoy webserver, click on the **Syslog->All** tab to open the **/data/cg_data/syslog/syslog.log** file.	Verify time-tagged entries are displayed, and the times coincide with the scheduled "wake" times as defined in the mission file.	L4-CG-PC-RQ-801			
18	On the buoy webserver, click on the **Syslog->GPS** tab to open the **/data/cg_data/gps/yyyymmdd.gps.log** file.	Verify time-tagged entries are displayed, and the latitude/longitude of the most recent entry is approximately the latitude/longitude of Woods Hole.	L4-CG-PC-RQ-801			
19	On the buoy webserver, click on the **Syslog->MPIC** tab to open the **/data/cg_data/superv/yyyymmdd.superv.log** file.	Verify time-tagged entries are displayed, and the most recent entry shows ports 2 and 5 are on. … **p2 1** <volt> <curr> <err> p3 0 0.0 0.0 p4 0 0.0 0.0 **p5 1** <volt> <curr> <err> ….	L4-CG-PC-RQ-801			
20	On the buoy webserver, click on the **Syslog->Irid** tab to open the **/data/cg_data/irid/yyyymmdd.irid.log** file.	Verify time-tagged entries are displayed, and that the beginning and ending transfer session times coincide with the Iridium transfer schedule in the mission file: ***** Begin Iridium transfer session** ***** End Iridium transfer session**	L4-CG-PC-RQ-732 L4-CG-PC-RQ-793 L4-CG-PC-RQ-801 L3-CG-RQ-1002 L4-CG-PC-RQ-75			
21						
22	On the "shore server", open the following log files: **/OMC/CP04OSPM/Dxxxxx/irid_sbd/yyyy_mmddhhmmss.log** **/OMC/CP04OSPM/Dxxxxx/syslog/yyyymmdd.syslog.log**	Verify the presence of platform status sent via SBD and ISU.	L4-CG-PC-RQ-865			

Step#	Instructions	Expected Results	Requirement ID	Observed Results	Pass/Fail	Notes
23	On the "shore server", open the following log file: **/OMC/CP04OSPM/Dxxxxx/imm/adcp/adcp_yyyymmdd_hhmmss.DAT**	Locate the last time-tagged entry in the file.	L4-CG-PC-RQ-691 L4-CG-PC-RQ-732 L4-CG-PC-RQ-775 L4-CG-PC-RQ-840 L4-CG-PC-RQ-874 L4-CG-TS-RQ-195 L4-CG-TS-RQ-199 L3-CG-RQ-163 L3-CG-RQ-293 L3-CG-RQ-599			
24	In the RFM console window, open the following log files containing the same time entry as found in **step#22**: **/data/cg_data/imm/adcp/adcp_yyyymmdd_hhmmss.DAT**	Verify time-tagged entries are displayed and the times coincide with the scheduled "wake" times for port 2 as defined in the mission file.	L4-CG-PC-RQ-625 L4-CG-PC-RQ-628			
25	Compare the time-tagged entry in the two files (**steps# 22 and 23**).	Verify the entries are the same.				
26	On the "shore server", open the following log file: **/OMC/CP04OSPM/Dxxxxx/imm/mmp/Axxxxxxx.DAT**	Locate the last time-tagged entry in the file.	L4-CG-PC-RQ-835 L4-CG-PC-RQ-840 L4-CG-PC-RQ-874 L4-CG-TS-RQ-195 L4-CG-TS-RQ-199 L4-CG-PR-RQ-378 L3-CG-RQ-163 L3-CG-RQ-293 L3-CG-RQ-599			Note: Axxxxxxx are data files that get written on each profile. The xxxxxxx starts at 0 on the first profile, and the file name is incremented by 1 on ech successive profile.
27	In the RFM console window, open the following log file containing the same time entry as found in **step#25**: **/data/cg_data/imm/mmp/Axxxxxxx.DAT**		L4-CG-PC-RQ-625 L4-CG-PC-RQ-628			
28	Compare the time-tagged entry in the two files (**steps# 25 and 26**).	Verify the entries are the same.				
29	On the "shore server", open the following log file: **/OMC/CP04OSPM/Dxxxxx/imm/mmp/Cxxxxxxx.DAT**	Locate the last time-tagged entry in the file.	L4-CG-PC-RQ-835 L4-CG-PC-RQ-840 L4-CG-PC-RQ-874 L4-CG-TS-RQ-195 L4-CG-TS-RQ-199 L4-CG-PR-RQ-378 L3-CG-RQ-163 L3-CG-RQ-293 L3-CG-RQ-599			Note: Cxxxxxxx are data files that get written on each profile. The xxxxxxx starts at 0 on the first profile, and the file name is incremented by 1 on ech successive profile.
30	In the RFM console window, open the following log file containing the same time entry as found in **step#28**: **/data/cg_data/imm/mmp/Cxxxxxxx.DAT**		L4-CG-PC-RQ-625 L4-CG-PC-RQ-628			
31	Compare the time-tagged entry in the two files (**steps# 28 and 29**).	Verify the entries are the same.				
32	On the "shore server", open the following log file: **/OMC/CP04OSPM/Dxxxxx/imm/mmp/Exxxxxxx.DAT**	Locate the last time-tagged entry in the file.	L4-CG-PC-RQ-835 L4-CG-PC-RQ-840 L4-CG-PC-RQ-874 L4-CG-TS-RQ-195 L4-CG-TS-RQ-199 L4-CG-PR-RQ-378 L3-CG-RQ-163 L3-CG-RQ-293 L3-CG-RQ-599			Note: Exxxxxxx are data files that get written on each profile. The xxxxxxx starts at 0 on the first profile, and the file name is incremented by 1 on ech successive profile.

	Test Procedure 3166-80104 Rev 1-00			Test Results		
Step#	Instructions	Expected Results	Requirement ID	Observed Results	Pass/Fail	Notes
33	In the RFM console window, open the following log file containing the same time entry as found in **step#31**: **/data/cg_data/imm/mmp/Exxxxxxx.DAT**		**L4-CG-PC-RQ-625** **L4-CG-PC-RQ-628**			
34	Compare the time-tagged entry in the two files (**steps# 31 and 32**).	Verify the entries are the same.				
35	On the "shore server", open the following log file: **/OMC/CP04OSPM/Dxxxxx/3dmgx3/yyyymmdd_hhmmss.3dmgx3.log**	Locate the last time-tagged entry in the file.	**L3-CG-RQ-163** **L3-CG-RQ-292** **L3-CG-RQ-293**			
36		Verify every third 3dmgx3 file Is transferred from the buoy.	**L4-CG-PC-RQ-292** **L4-CG-PC-RQ-890** **L4-CG-PC-RQ-635**			
37	In the RFM console window, open the following log files containing the same time entry as found in **step#34**: **/data/cg_data/3dmgx3/yyyymmdd_hhmmss.3dmgx3.dat**		**L4-CG-PC-RQ-738**			
38	Compare the time-tagged entry in the two files (**steps# 34 and 36**).	Verify the entries are the same.				
39	On the "shore server", check the following directory for a syslog.log file: **/OMC/CP04OSPM/Dxxxxx/syslog**	Verify a syslog.log file for this profile has not been transferred to the "shore server".				
40	**Use test183B_Mission.cfg and test_DefaultSerial.cfg files** (test183B_Mission.cfg will set irid, fwwf, gps on and sbd off; initialize the imm port (#2) to be on for 30 minutes each hour; set 3dmgx3 port (#5) to be off; set gps as the pps_source)					
41	On the "shore server", copy the test183B mission file to /test0001/cfg_files/cpm_mission.cfg as follows: **cd /test0001/cfg_files** **cp test_proc/test183B_Mission.cfg cpm_mission.cfg**		**L4-CG-PC-RQ-775**			
42	At 3 hours from start, verify the buoy "wakes up".	Text is written to the STC login window, indicating the console (linux) is starting.	**L4-CG-PC-RQ-76**			
43	Verify the new stc_mission.cfg file is being used. (turned 3dmgx3 transfers off) by typing the following in the RFM console window: **tail -f /data/cg_data/3dmgx3/yyyymmdd_hhmss.3dmgx3.log**	Verify 3dmgx3 data is not being logged.	**L4-CG-PC-RQ-775** **L4-CG-PC-RQ-727** **L3-CG-RQ-164** **L3-CG-RQ-761**			
44	Verify ADCP data is still being logged by typing the following in the RFM console window: **tail -f /data/cg_data/imm/adcp/adcp_yyyymmss.DAT**	Verify adcp data is being logged.	**L4-CG-PC-RQ-625** **L4-CG-PC-RQ-628** **L4-CG-PC-RQ-840**			
45	Verify buoy goes back to a "sleep" state after all available data has been transferred.	Text is written to the STC login window, indicating the console (linux) is shutting down.	**L4-CG-PC-RQ-749**			
46	From the profiler setup software, turn off the inductive sending session.					
47	After 4 hours, verify the buoy "wakes up".	Text is written to the STC login window, indicating the console (linux) is starting.	**L4-CG-PC-RQ-76**			
48	Close the log files on the"shore server" and buoy.					

Step#	Instructions	Expected Results	Requirement ID	Observed Results	Pass/Fail	Notes
49	On the STC, capture the following files: /data/cg_data/syslog/syslog.log /data/cg_data/syslog/cpm_status.txt /data/cg_data/syslog/dcl_status.txt /data/cg_data/superv/yyyymmdd.superv.log /data/cg_data/gps/yyyymmdd.gps.log /data/cg_data/3dmgx3/yyyymmdd_hhmmss.3dmgx3.log /data/cg_data/irid/yyyymmdd.irid.log /data/cg_data/imm/adcp/adcp_yyyymmdd_hhmmss.DAT /data/cg_data/imm/mmp/Cxxxxxxx.DAT /data/cg_data/imm/mmp/Exxxxxxx.DAT /data/cg_data/imm/mmp/Sxxxxxxx.DAT					
50	On the "shore server", capture the following files: /OMC/CP04OSPM/Dxxxxx/syslog/syslog.log /OMC/CP04OSPM/Dxxxxx/syslog/stc_status.txt /OMC/CP04OSPM/Dxxxxx/superv/yyyymmdd.superv.log /OMC/CP04OSPM/Dxxxxx/gps/yyyymmdd.gps.log /OMC/CP04OSPM/Dxxxxx/3dmgx3/yyyymmdd_hhmmss.3dmgx3.log /OMC/CP04OSPM/Dxxxxx/irid/yyyymmdd.irid.log /OMC/CP04OSPM/Dxxxxx/imm/adcp/adcp_yyyymmdd_hhmmss.DAT /OMC/CP04OSPM/Dxxxxx/imm/mmp/Cxxxxxxx.DAT /OMC/CP04OSPM/Dxxxxx/imm/mmp/Exxxxxxx.DAT /OMC/CP04OSPM/Dxxxxx/imm/mmp/Sxxxxxxx.DAT					
51	In the RFM console window, restore the current configuration files as follows: cd /data/cg_data/cfg_files mv save_stc_mission.cfg stc_mission.cfg mv save_stc_stc_serial.cfg serial.cfg					
52	In the RFM console window, shut down the buoy by typing the following from ucmd: cd current bin/ucmd _goto_sleep quit					
53	Close the RFM console window, the SSH buoy window and the web browser.					
54	Replace the magnet.					
55	Power down the external power supply.					