

SCIMPI Phase III First Quarter Project Update

April 23, 2011

Team Members:

University of Rhode Island/Institute for Exploration:

Kate Moran kate.moran@gso.uri.edu

Tania Lado Insua ladoinsuat@egr.uri.edu

Ian Kulin iankulin@gso.uri.edu

Woods Hole Marine Systems, Inc.

Jim Newman jim@whmsi.com

Transcendev, Inc.

Steve Farrington stephen@transcendev.com

Stress Engineering

Tom Pettigrew Thomas.Pettigrew@stress.com

David Huey dave.huey@stress.com

Lamont Doherty Earth Observatory (collaboration)

Eric Meissner meissner@ldeo.columbia.edu

Geraldo Iturrino iturrino@ldeo.columbia.edu

Dave Goldberg goldberg@ldeo.columbia.edu

IODP Program Manager

Yoshi Kawamura YKawamura@iodp.org

Administration Actions Completed

Present full budget for SCIMPI is set at \$921,572. To date URI has invoiced \$752,208.50 of the project to IODP-MI.

The SCIMPI team an Ancillary Project Letter (APL) sent on October 4 to IODP for a proposed engineering test of SCIMPI during the June 2011 D/V *JOIDES Resolution* transit from Panama to Galveston. This was later updated for a destination change of Curacao. The IODP Science Steering and Evaluation Panel (SSEP) reviewed the APL (785-APL) and provided feedback to the team in December 2010. The SCIMPI team responded to the specific comments made by the SSEP in January. The SSEP also forwarded the proposal to the Science Planning Committee (SPC) for review during their March meeting.

The SCIMPI Team submitted a presentation for the Scientific Technology Panel (STP) February meeting in New Zealand and for the Engineering Development Panel (EDP) meeting February 22 in France. No word back on this but timing past critical.

Stress Engineering signed an agreement with Lamont Doherty Earth Observatory (LDEO) on construction of an additional MFTM module for use with SCIMPI mid February 2011.

Fabrication of second MFTM has started. ERS is also in final construction by Stress.

Design Build Team Actions/Decisions Completed

The cables and connectors for SCIMPI are on site at URI with module spacing lengths based on approval to deploy per 785-APL.

The flotation for the modules produced by CMT Materials is on site at URI. Floats are rated for a maximum deployment depth of 1500 meters.

The team plans to use the Lamont MFTM to interface the SCIMPI tool with the Schlumberger logging equipment during deployment. The MFTM will also connect the release mechanism (ERS) being developed by Stress Engineering to the surface. Production of the MFTM module and the ERS is in progress.

Production of modules was completed in February 2011. Refinement of design and measurement capabilities continues.

Load testing of battery configurations completed with results to date in line with projected values. Various configurations, intervals and manufactures were tested.

Final assembly of all modules completed, modules presently at Transcendev.

Testing and Deployment Actions/Decisions Completed

Team assembled entire SCIMPI array as proposed in APL at URI on February 11.

Communication and readings from all sensors in this dry test were as anticipated and successful.

SCIMPI went to sea on URI's R/V *Endeavor*, March 23 – 25 for field verification in the water column to a minimum 1000 meter water depth. Testing occurred offshore New Jersey over one full day. Deteriorating weather conditions resulted in reducing the test time to ten hours.

Electrical resistivity sensors malfunctioned when two or more modules were immersed simultaneously indicating either insufficient electrical isolation or a ground loop involving ships power systems. Tests are in progress to determine cause so that modules can be corrected.

Communications were interrupted between the datalogger and measurement modules below 150 meters immersion depth suggesting pressure sensitive cable defect. Cable manufacture notified and cables sent back to manufacturer for verification and corrections.

A proposal to UNOLS for ship time to recover data with an ROV is on hold based on 785-APL deployment not being approved.

LDEO indicates that testing of the prototype MFTM to date has been completed and they are working on the second MFTM.

URI plans further tests of SCIMPI once LDEO and Stress have completed the second MFTM and the revised ERS. Schedule with testing is open to avoid conflict with T2P testing scheduled for this summer.

SCIMPI Phase III Second Quarter Project Update

July 28, 2011

Team Members:

University of Rhode Island/Institute for Exploration:

Kate Moran kate.moran@gso.uri.edu
Tania Lado Insua ladoinsuat@egr.uri.edu
Ian Kulin iankulin@gso.uri.edu

Woods Hole Marine Systems, Inc.

Jim Newman jim@whmsi.com

Transcendev, Inc.

Steve Farrington stephen@transcendev.com

Stress Engineering

Tom Pettigrew Thomas.Pettigrew@stress.com
David Huey dave.huey@stress.com

Lamont Doherty Earth Observatory (collaboration)

Eric Meissner meissner@ldeo.columbia.edu
Geraldo Iturrino iturrino@ldeo.columbia.edu
Dave Goldberg goldberg@ldeo.columbia.edu

IODP Program Manager

Yoshi Kawamura YKawamura@iodp.org

Administration Actions Completed

Present full budget for SCIMPI is set at \$921,572. To date URI has invoiced \$810,298.67 of the project to IODP-MI. URI anticipates another invoice within the next few weeks.

The SCIMPI team Ancillary Project Letter (APL) originally sent on October 4, 2010 to IODP for a proposed engineering test of SCIMPI was updated in January and again in March 2011 as potential deployment locations changed.

The SCIMPI Team submitted a presentation for the Scientific Technology Panel (STP) February meeting in New Zealand and for the Engineering Development Panel (EDP) meeting February 22 in France. Feedback from these two meetings did not provide any decision on deployment timing or locations. The OTF held another meeting on June 10 -11 with SCIMPI on the agenda. The team was not provided any new information regarding timing or locations so the previous information provided was the base for discussions at this meeting. The OTF has recommended testing potentially for SCIMPI in FY 2013 possibly prior to EXP 341 S. Alaska.

ERS testing continues by Stress and LDEO; two ERS tools now located at TAMU and in the care of IODP-MI. Further testing of MFTM and ERS along with the T2P Tool is expected in the next few days. Lamont pending further testing on the JOIDES Resolution in 2012.

Design Build Team Actions/Decisions Completed

The cables and connectors for SCIMPI are on site at URI with module spacing lengths based on approval to deploy per 785-APL.

The flotation for the modules produced by CMT Materials is on site at URI. Floats are rated for a maximum deployment depth of 1500 meters.

The team plans to use the Lamont MFTM to interface the SCIMPI tool with the Schlumberger logging equipment during deployment. The MFTM will also connect the release mechanism (ERS) being developed by Stress Engineering to the surface. Production of the MFTM module and the ERS is completed.

Modules are presently in storage at URI. Given news of delay until 2013 modules will need to be placed in long-term storage and internal batteries will require replacement prior to any future deployment. This requires non-trivial disassembly and re-assembly of the pressure housings.

Testing and Deployment Actions/Decisions Completed

Team assembled entire SCIMPI array plus spares in June in the configuration detailed in the APL and deployed all in Narragansett Bay adjacent to the Bay Campus of URI on June 29. Communication and readings from all sensors in this wet test were as anticipated and successful on eight of ten modules. One module systematically over-reported resistivity values and has been sent back to Transcendev for confirmation of the sensor calibration. A second module intermittently reported an error code used to indicate when it is in air (a non-conductive medium), the cause of which is being investigated.

Communications problems between the datalogger and measurement modules below 150 meters immersion depth during the March sea trial were definitively traced to a defect in the wet-matable cable connector design. Cable manufacturer (Seacon Banter) is in final process of remanufacturing wet connect cable sections with an anticipated ship date of August 17.

A proposal to UNOLS for ship time to recover data with an ROV is on hold pending deployment location and timing approvals.

LDEO indicates that testing of the prototype MFTM to date has been completed and they completed fabrication of the second MFTM.

URI would like to plan further tests of SCIMPI with LDEO and Stress once their testing of the MFTM and ERS is completed. Schedule with testing is open to avoid conflict with T2P testing scheduled for this month. SCIMPI test site location has not yet been determined and team anticipates once location determined additional costs for modifying cabling, new batteries and team member involvement time will be incurred.

Team will work this month to provide all documentation and O&M to IODP-MI prior to close FY2011.

SCIMPI Phase III Third Quarter Project Update

October 14, 2011

Team Members:

University of Rhode Island/Institute for Exploration:

Kate Moran kmoran@uvic.ca
Tania Lado Insua ladoinsuat@egr.uri.edu
Ian Kulin iankulin@gso.uri.edu

Woods Hole Marine Systems, Inc.

Jim Newman jim@whmsi.com

Transcendev, Inc.

Steve Farrington stephen@transcendev.com

Stress Engineering

Tom Pettigrew Thomas.Pettigrew@stress.com
David Huey dave.huey@stress.com

Lamont Doherty Earth Observatory (collaboration)

Eric Meissner meissner@ldeo.columbia.edu
Geraldo Iturrino iturrino@ldeo.columbia.edu
Dave Goldberg goldberg@ldeo.columbia.edu

IODP Program Manager

Yoshi Kawamura YKawamura@iodp.org

Administration Actions Completed

Present full budget for SCIMPI is set at \$921,572. To date URI has invoiced \$871,942 of the project to IODP-MI.

The SCIMPI team received word this past summer from the OTF recommended testing for SCIMPI in FY 2013 possibly prior to EXP 341 S. Alaska. Sites being considered are CRISP sites off Costa Rica or other sites further north. Timing may require CRISP sites due to weather conditions on Pacific Northwest in winter months.

ERS and MFTM testing continues by Stress and LDEO; two ERS tools now located at TAMU and in the care of IODP-MI. Further testing of MFTM and ERS along with the T2P Tool was completed September in Texas at Schlumberger Sugarland Facility. IODP and Stress working on a contract for revisions to the ERS design.

Design Build Team Actions/Decisions Completed

The cables, connectors and floatation for SCIMPI are on site at URI with module spacing lengths based on approval to deploy per 785-APL. Floats are rated for a maximum deployment depth of 1500 meters so any future site selection will require coordination of depth and spacing.

The team will use the Lamont MFTM to interface the SCIMPI tool with the Schlumberger logging equipment during deployment. The MFTM will also connect the release mechanism (ERS) by Stress Engineering to the surface. Production of the MFTM module and the ERS is completed yet both also have revisions planned.

Modules are presently in storage at URI. Given news of delay until 2013 modules will need to be placed in long-term storage and internal batteries will require replacement prior to any future deployment. This requires non-trivial disassembly and re-assembly of the pressure housings.

Testing and Deployment Actions/Decisions Completed

Team assembled entire SCIMPI array plus spares this June in the APL configuration and deployed all in Narragansett Bay adjacent to the Bay Campus of URI on June 29. This test followed the module modifications completed after the March sea trial to solve an electrical current leakage problem that caused undesirable interaction between the temperature and resistivity sensors. That problem was solved by designing and adding a "personality" board between the Measurement Supervisor board and the sensors that it supervises, which improved electrical isolation of the sensors.

At the June test, two modules were not functioning properly. One module's resistivity sensor would intermittently report an "unstable value" error code. This problem was traced in the lab to a faulty microchip in the sensor. The entire sensor board was replaced with a new one, re-calibrated, and verified in KCl solution.

Also at the June test, a resistivity sensor in a second module appeared to be out of calibration. Calibration was re-checked against KCl solution in the laboratory and found to indeed be off. New calibration coefficients were programmed into the sensor and verified against laboratory KCl standards prior to shipping both modules back to URI in September.

Communications problems between the datalogger and measurement modules below 150 meters immersion depth during the March sea trial were definitively traced to a defect in the wet-matable cable connector design. Cable manufacturer (Seacon Banter) has rebuilt the wet connect cable sections and is presently pressure testing the assembly with an anticipated ship date of October 31 to URI.

A proposal to UNOLS for ship time to recover data with an ROV has been updated to reflect the new deployment location and timing.

LDEO indicates that testing of the prototype MFTM to date has been successful, they completed fabrication of the second MFTM and a third is in progress.

URI is planning further tests of SCIMPI with LDEO and Stress once their testing of the MFTM and ERS is completed. Schedule with testing is set for November 30 at LDEO to avoid conflict with T2P testing and any ERS work. SCIMPI test site location has not yet been determined and team anticipates once location determined additional costs for modifying cabling, new batteries and team member involvement time will be incurred.

Team is finalizing all documentation and O&M to IODP-MI prior to end of 2011.

SCIMPI Phase III Fourth Quarter Project Update

December 30, 2011

Team Members:

University of Rhode Island/Institute for Exploration:

Kate Moran kmoran@uvic.ca
Tania Lado Insua ladoinsuat@egr.uri.edu
Ian Kulin iankulin@gso.uri.edu

Woods Hole Marine Systems, Inc.

Jim Newman jim@whmsi.com

Transcendev, Inc.

Steve Farrington stephen@transcendev.com

Stress Engineering

Tom Pettigrew Thomas.Pettigrew@stress.com
David Huey dave.huey@stress.com

Lamont Doherty Earth Observatory (collaboration)

Eric Meissner meissner@ldeo.columbia.edu
Geraldo Iturrino iturrino@ldeo.columbia.edu
Dave Goldberg goldberg@ldeo.columbia.edu

IODP Program Manager

Yoshi Kawamura YKawamura@iodp.org

Administration Actions Completed

Present full budget for SCIMPI is set at \$921,572. To date URI has expended Approximately \$916,225 and anticipates completing the project \$5347 under the budget. University of Rhode Island Accounting Office will send final invoice to IODP-MI as soon as they are capable.

The SCIMPI team received word this past summer from the OTF recommended testing for SCIMPI in FY 2013 possibly prior to EXP 341 S. Alaska. Sites being considered are CRISP sites off Costa Rica or other sites further north. Timing may require CRISP sites due to weather conditions on Pacific Northwest in winter months.

ERS and MFTM testing completed by Stress Engineering and Lamont Doherty Earth Observatory (LDEO); two ERS tools now located at TAMU and in the care of IODP-MI. Further refinements of MFTM and ERS along with the T2P Tool are in progress. IODP and Stress signed a contract in November for revisions to the ERS design.

Design Build Team Actions/Decisions Completed

The cables, connectors and floatation for SCIMPI are on site at URI with module spacing lengths based on approval to deploy per 785-APL. Floats are rated for a maximum deployment depth of 1500 meters so any future site selection will require coordination of depth and spacing.

The team will use the Lamont MFTM to interface the SCIMPI tool with the Schlumberger logging equipment during deployment. The MFTM will also connect the release mechanism (ERS) by Stress Engineering to the surface. Production of the MFTM module and the ERS is completed yet both also have revisions planned.

Modules are presently in storage at URI. Given news of delay until 2013, modules will be placed in long-term storage and internal batteries will require replacement prior to any future

deployment. This requires non-trivial disassembly and re-assembly of the pressure housings. Present plan is to ship entire SCIMPI to TAMU for storage and any work on batteries would be completed prior to future cruise.

Testing and Deployment Actions/Decisions Completed

Team assembled entire SCIMPI array plus spares late November at LDEO. The APL configuration was used for this exercise. This test was a full bench test utilizing the ERS, MFTM, and a 20,000-foot Schlumberger logging cable. The testing was completed with the ERS in both a vertical and horizontal position.

Unexpected delay in the promptness with which the datalogger streams data to the surface computer was observed when power source to the datalogger was switched between uphole (ship supply) and downhole (batteries), but this was quickly recognized to be expected as the result of the pre-programmed power savings mode that the instrument would place itself in during actual operations. This can be changed by remote adjustment of the in situ sampling rate programmed into the datalogger, which requires a complete power-down and re-boot of the datalogger to effect—something that does not happen when the internal batteries are present in connected measurement modules. In actual operation, the situation in which power from the surface is cycled after connecting the battery-powered modules should not be encountered, and would not pose a problem for deployment; the only effect being that data streaming to the surface computer would not resume until the in situ sampling period (1 hr by default) had passed. There were no other apparent problems with the test and as such the test was a success.

A proposal to UNOLS for ship time to recover data with an ROV has been updated to reflect the new deployment location and timing.

Final SCIMPI test site location has not been determined and team anticipates once location determined additional costs for modifying cabling, new batteries and team member involvement time will be incurred. Present options remain a CRISP deployment early in 2013 or a later deployment in Cascadia perhaps prior to the Alaska Leg in July 2013. TAMU and IODP-MI working on options and SCIMPI team continues to provide input.

CRISP site selection will require some additional cable lengths and terminations and the floats would have to be replaced with ones of a deeper rating due to the depth of the CRISP sites. We estimate an additional \$60,000 cost for a deployment with floats rated to 2000 meter.

Cascadia site offers potential future tie into Neptune Canada Network and SCIMPI team has requested from Neptune an estimate of cost for connection and maintenance support. Floats and module spacing will work for this site but timing with ship becomes problematic. SCIMPI team would have to find way off JR after deployment on front end of Alaska Leg. SCIMPI team participated in two days of meetings December 1 and 2 at MBARI with Proposal 553 Cascadia team to present options for including SCIMPI in proposal. Team also presented a poster and participated in meetings with IODP, NFS and other potential partners at AGU in San Francisco. Follow up included a review with the engineering team at Neptune Canada in Victoria to allow for SCIMPI future connection to the network. Neptune Canada will be providing a letter of support for a future SCIMPI deployment as part of Proposal 553.

Team is including all documentation and O&M to IODP-MI with this submission as this will be the final SCIMPI report pending deployment in 2013.