

MONTHLY PROGRESS REPORT	
Contractor Name: University of Notre Dame (Michael Lemmon)	
Contractor Address: Office of Research, 940 Grace Hall, Notre Dame, IN 46556	
Contract/Purchase Order No. W9132T-10-C-0008 (prime contract no.)	Task Order No.
Project Title: Design and Simulation of Intelligent Control Architecture for Military Microgrids	
Period Covered: September 1 2010 – October 1, 2010	
POC/COR (Reference Paragraph 5 of the SOW):	
Achievements (Describe by task. Add additional tasks, if needed.): task numbers refer to tasks in Odysian’s original contract	
1) Prepared and delivered (September 14) technical interim report to Odysian and UWM 2) Prepared and delivered presentation at project status meeting (Sept 23) summarizing results from interim technical report	
Task II: Model and Simulate Intelligent Microgrid	
1) Discussed differences between UWM and UND microgrid simulations (10/1). Main differences lie in the way UND couples microsources to the mesh grid.	
Task III: Distributed Control Algorithm Development	
No achievements this month.	
Task VI: Develop Wireless Communication	
1) Provided Odysian (9/29) with recommendations on building their wireless communication subsystems. It was recommended that they use a Linux single board computer (SBC) to implement the dispatch algorithms. It was recommended that they separate the processes used to make load shedding or dispatch decisions from the computer modules controlling the communication network stack. Recommended that interface between these two modules be done over a traditional serial (preferably RS-232) interface. Discussed with Odysian the relative merits and weaknesses of using Wi-Fi and Zigbee wireless networking solutions.	
Task VII: Develop Wireless Distributed Control	
1) Provided Odysian (9/29) with initial recommendations on the “control” block diagram they presented at the 9/23 telecon. It was recommended that they adopt a flatter	

architecture whose blocks directly correspond to the computer processes they'll need to write for their controller. Six main blocks were identified; communication module, dispatch algorithm, load priority assignment block, load shedding block, load re-integration module, and communication module interfacing to e-board/Certs controller.

Problems Encountered (Describe by task. Add additional tasks, if needed):

Task II: None

Task III: None

Task VI: None

Task VII: None

Open Items (List items that require action by the Contractor or the Government):

No open items

Summary Assessment and Forecast (Provide an overall assessment of the work and a forecast of contract completion):

Comparison between UWM and UND simulation models appear to be relatively close. Main differences may be attributed to differences in parameters used to couple microsources to the grid. These differences will be resolved through more detailed testing of UND's simulation and checking those simulations against the experimental results UWM has obtained from their hardware testbed.

Consultation with Odysian suggests they may need additional guidance with regard to the architecture of the software components they'll construct for their demonstration. One of next month's objectives will be to provide a preliminary document specifying the software/hardware architecture that should be used in building the computational agents realizing the dispatch and intelligent load shedding algorithms.