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Title:	Fuel Cycle Technologies FCT Research and Technology Development Campaigns Monthly Campaign Performance Review
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Intended for:	Monthly program progress teleconference

Los Alamos
NATIONAL LABORATORY
EST. 1943

Form 836 (7/06)

Abstract and Summary

LA-UR-

Fuel Cycle Technologies
FCT Research and Technology Development Campaigns
Monthly Campaign Performance Review – MPACT

November monthly non-technical progress report slides for the Materials Protection, Accounting and Control Technology Campaign being presented via teleconference to members of the Fuel Cycle Technologies, FCT Research and Technology Development national campaigns. Presentation includes status updates on various campaign projects and planned activities for next month.

Fuel Cycle TECHNOLOGIES
safe • secure • sustainable

Fuel Cycle Technologies

FCT Research and Technology Development Campaigns
Monthly Campaign Performance Review

Mark Mullen
National Technical Director – MPACT (1.02.04)
FY 2012 November Data
Held: January 5, 2012 at 10:30 AM (EST)

Dial in: TBD

NE-5
Office of Nuclear Energy
U.S. Department of Energy

MPACT
Milestone Status – M2's

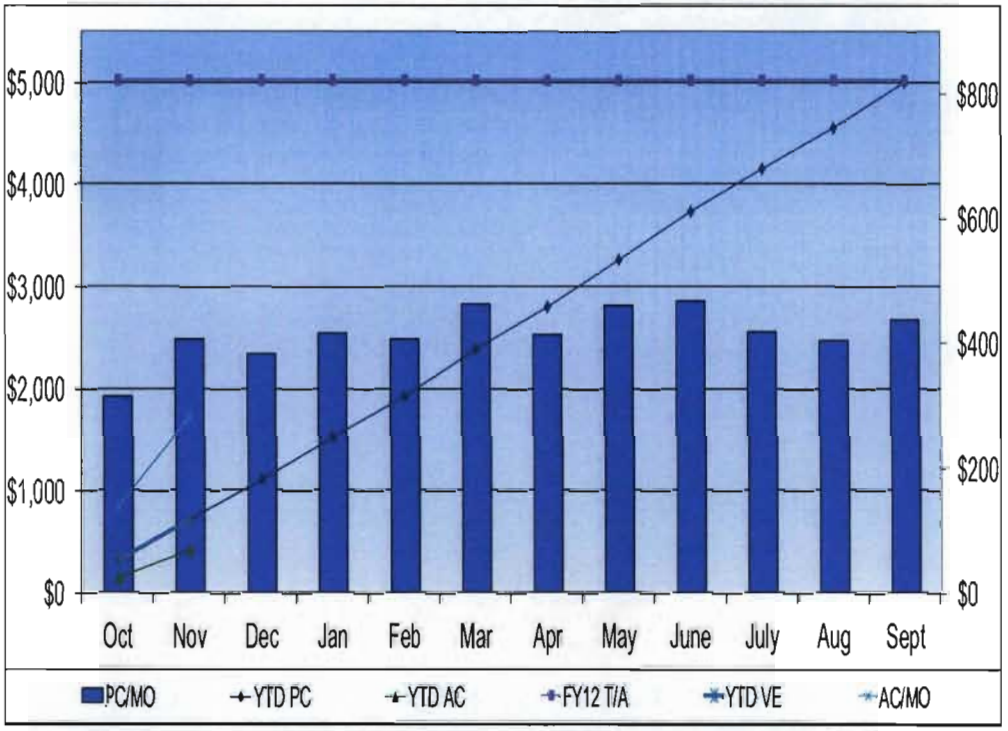
Milestone Number	Title	Level	Estimated Finish Date	Revised Finish Date	Actual Finish Date	$ Impact	QRL
1.02.04.02 - Accounting and Control Technologies							
M2FT-12IN0402021	Test different reference/sense electrode designs for impedance and compatibility with electrolyte	M2	7/31/2012			-	QRL3
M2FT-12OR0402041	Complete proof-of-concept imaging measurements to quantify SNM in holdup configurations	M2	8/31/2012			-	N/A
M2FT-12LA0402011	Demonstrate simultaneous multiplexed readout of high-yield 256 pixel array with total counting rate in the kHz range	M2	8/31/2012			-	QRL3
M2FT-12IN0402031	Model the performance of active neutron interrogation/liquid scintillator for assaying fuel cycle materials	M2	10/31/2012			-	QRL3
1.02.04.03 - MPACT Analysis Tools							
M2FT-12LA0403112	Document proliferation and security evaluation criteria for use in next fuel cycle options screening	M2	6/30/2012			-	QRL3
M2FT-12PN0403017	Complete and Document Automatic Algorithm for MIP	M2	7/31/2012			-	QRL3
M2FT-12SN0403042	Complete and document baseline electrochemical model and MPACT sensitivity analysis	M2	10/31/2012			-	QRL3

MPACT
Cost Performance ($Ks)

			MONTHLY				CUMULATIVE				CHANGE (%)
WBS	Title	Total Available	VE	AC	Var (VE-AC)	Var (%)	VE	AC	Var (VE-AC)	Var (%)	From Prior Month
1.02.04	MPACT	5,024	406	282	124	30.62%	721	420	301	41.78%	↑ 14.36%

Cost Variation

The cost underrun variation is due to beginning-of-fiscal-year budget uncertainties, causing principal investigators to spend very cautiously. In addition, MPACT realignment is slowing certain tasks until baseline change requests are executed early in calendar year 2012.



MPACT
Major Accomplishments

Management and Integration:

- [LANL] MPACT Management and Integration: Mark Mullen participated in the Fuel Cycle Technologies Annual Meeting at ANL, November 8-10, 2012, and arranged a side meeting on November 10 concerning electrochemical modeling and simulation. He also hosted two visitors from DOE/NE on November 30-December 1 to review MPACT strategy and projects. LANL staff reviewed prior studies and reports on proliferation and security metrics, and are preparing a summary assessment, in preparation for the report on metrics due later in FY12. Plans were initiated for SRNL to host the MPACT working group meeting in March, 2012.

Accounting and Control Technologies:

- [LANL] Microcalorimetry: The new detector array has been transferred from NIST to LANL. Project staff successfully completed multiplexing the entire 256 pixel array in testing at NIST with 239 pixels producing data. New spectral peak fitting code is working on the microcalorimeter and HPGe data.

- [INL] Electrochemical Sensor: Post-exchange high-temperature annealing tests have started. Samples from the first test have undergone SEM analysis.

- [INL] Fast Neutron Multiplicity Analysis: The subcontract the University of Michigan was completed. Project staff will be having a kick-off call and meeting in December with the team in Ann Arbor at the University of Michigan.

- [ORNL] Fast Neutron Imaging to Quantify Nuclear Materials : Effort thus far has concentrated on trying to obtain information regarding the configuration of SNM during steps of reprocessing, particularly during processing of powder. Such information consists of material quantities, geometry of processing equipment, distance between discrete steps in processing, etc. It turns out that detailed and exact information is hard to come by, so some level of informed judgment will be required to come up with imaging scenarios.

MPACT
Major Accomplishments

- [LANL] Lead Slowing Down Spectrometer: LANL found a major source of the discrepancy between the measured and simulated Pu239 data. Analysis is continuing. Project staff are working with the LANL physics division to construct a He4 proportional counter that will be tested in the coming months.

- [PNNL] Lead Slowing Down Spectrometer : PNNL initiated work on the analytical model using MCNP to track the flux in each fission chamber for cases in which one unirradiated fuel pin is inserted within the assay chamber. UNLV was able to further increase the deposition thickness of uDU, and the acquired thorium metal foil to begin to study Th deposition. At ISU, a masters thesis on the calibration of the uDU foils was successfully defended. Calibration measurements using three different neutron fields were completed. Some discrepancies in the measurements were observed.

MPACT Analysis Tools:

- [PNNL] Multi-isotope Process Monitor: MIP Monitor FY11 progress was presented at the FCT Annual Meeting by Chris Orton, a former AFCI Graduate Fellow. Analysis was initiated on the dynamic flow-loop data collected in late FY11. The University of Texas team continued their investigation of multivariate algorithms for spent fuel classification. An abstract to the MARC IX radiochemistry conference was submitted by the project team at PNNL. Additionally, abstracts were submitted by Sarah Bender at Pennsylvania State University and Kenneth Dayman at University of Texas to the MARC IX conference under sponsorship of their respective forensics fellowships. Ms. Bender's abstract is directly related to MIP Monitor research efforts and Mr. Dayman's presentation is peripherally related to the MIP Monitor project. Professor Sheldon Landsberger from the University of Texas also submitted an abstract to the conference in coordination with the MIP Monitor work. Minor experimental work will commence to gain preliminary understanding of the uncertainty expected from multivariate analysis of gamma-ray spectra collected by a lanthanum bromide detector.

MPACT
Issues and Concerns
(Include any anticipated baseline changes)

None

MPACT
Look Ahead (60-90 Days)
(General items and meetings)

- [LANL] MPACT Management and Integration: Global 2011 will occur the week of December 12 in Japan. LANL's Scott Demuth will attend and will present a paper on safeguards and security by design. The MIP Monitor will be presented at the GLOBAL 2011 December 14th by PNNL staff member David Wootan, a PNNL-funded conference participant.

- Next MPACT Working group, March 2012, Savannah River National Laboratory.