ICESat-2 Control Account / Work Package / Charge Code Construct

March 23, 2011

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Background and Guidelines

- **The EVM Capability Project went through several iterations regarding the Control Account (CA) / Work Package (WP) / Charge Code construct for ICESat-2**
- **This construct is extremely important not only for EVM, but also for <u>good schedule / budget integration</u> and should carefully be considered during future replans of the project**
- **Some of the guiding principles that were (eventually) agreed upon:**
  - Maintain the existing project charge codes so as not to affect existing procurements, etc.
    - Project should reconsider this guideline for future replans and procurements
  - A WP does not have to be a SAP charge code, i.e. multiple WP can summarize to a single charge code
  - A charge code does not have to be an EVM CA, i.e. multiple charge codes can summarize to a single EVM CA
  - Budgets should be planned at the WP level
  - Actuals can be collected (i.e. charge codes) at the WP level or higher, but no higher than the EVM CA
    - In the EVM software tool, actuals are collected at the “Control Account” level, but this is not necessarily the EVM CA

Background and Guidelines (cont.)

- **Only a subset of the entire project will be baselined due to time constraints and access to project CAMs**
  - Guidelines for Baselined CA
    - Discrete CA
      - Use WP construct provided by CAMs
    - LOE CA
      - Use CAM WP construct if provided (e.g. WBS 09 Ground System), or
      - Create construct based on project phase
        - WP for Phase A/B (time now through Mission PDR, Feb, 2012)
        - PP for Phase C/D (Mission PDR to end of work scope)
  - Guidelines for Non-Baselined CA
    - One LOE WP through May, 2011
    - One Planning Package for reminder of effort
    - Assume ICESat-2 Project will continue planning efforts started by the EVM Capability team and convert the PP into discrete WPs and baseline them via the change process

Issued that Were Addressed

- **Actuals that were collected at both a summary level and the levels below**
- **Non-baselined CA do not have a summary bar within the IMS for a one-to-one tie for schedule / budget integration**
  - Didn’t want to burden schedulers with an arbitrary break at May 31, 2011

EVM CA

- **EVM CA selected based upon**
  - Input from ICESat-2 Project and CAMs
  - Level of current budget planning
  - Level at which actuals are currently collected
  - Consistency within a WBS element
- **42 EVM CAs**
  - 9 Baseline C
    - 1st column "x"
  - 28 non-baseline CA
    - 1st column blank
  - 5 historical CA
    - Gray shading

BL	SAP WBS	Cobra WBS	Name	PMT	EVM CA
x	883151.01	883151.01	Project Management		x
x	883151.02	883151.02	Systems Engineering		x
x	883151.03	883151.03	Safety & Mission Assurance		x
	883151.04	883151.04	Science/Technology		x
	883151.05.01	883151.05.01	GSFC-IceSat Instrument Management		x
	883151.05.02	883151.05.02	GSFC-IceSat Instrument Systems Engineeri		x
	883151.05.03	883151.05.03	GSFC-Icesat Safety & Mission Assurance		x
	883151.05.04	883151.05.04	GSFC-IceSat Instrument Payload Pre-Phase		h
	883151.05.05.01	883151.05.05.01	GSFC-IceSat Optical Systems		x
	883151.05.05.02.01	883151.05.05.02.01	GSFC-IceSat Mechanisms		x
x	883151.05.05.02.02	883151.05.05.02.02	GSFC-IceSat Structures		x
	883151.05.05.02.03	883151.05.05.02.03	GSFC-Icesat Project Mechanical Support		x
	883151.05.05.03	883151.05.05.03	GSFC-IceSat Transmitter Integrated Produ		x
	883151.05.05.04	883151.05.05.04	GSFC-IceSat Laser Reference Sys Integrat		x
x	883151.05.05.05	883151.05.05.05	GSFC-IceSat Thermal Systems		x
	883151.05.05.06	883151.05.05.06	GSFC-IceSat InstrumentElectronics Module		x
	883151.05.05.07	883151.05.05.07	GSFC-IceSat Flight Software		x
x	883151.05.05.08	883151.05.05.08	GSFC-IceSat Detectors		x
	883151.05.05.09	883151.05.05.09	GSFC-IceSat Instrument I&T		x
	883151.05.05.10	883151.05.05.10	GSFC-IceSat BCE & Instrument Simulators		x
	883151.05.05.11	883151.05.05.11	GSFC-IceSat Flight Algorithms		x
	883151.05.05.12	883151.05.05.12	GSFC-IceSat Power Subsystem		x
	883151.05.05.13	883151.05.05.13	GSFC-Icesat Cross Track Channel		h
	883151.05.05.14	883151.05.05.14	GSFC-Icesat Transmitter (TX) Risk Mitiga		h
	883151.05.05.15	883151.05.05.15	LaRC-Icesat Transmitter Analysis		h
	883151.05.05.16	883151.05.05.16	GSFC-Icesat Detector Array Assembly		x
	883151.05.05.17	883151.05.05.17	GSFC- Optical Filter Assy Integrated Products		x
	883151.05.05.18	883151.05.05.18	GSFC- Materials Engineering and Processes		x
	883151.05.05.19	883151.05.05.19	GSFC- Optical EM Instrument		x
	883151.05.05.20	883151.05.05.20	GSFC-ARRA-Icesat Recovery Act Funds		h
	883151.05.05.21	883151.05.05.21	GSFC- FLATLAS Electrical EM Instrument		x
	883151.05.05.22	883151.05.05.22	GSFC- Wire Harness		x
	883151.05.05.23	883151.05.05.23	GSFC- EEE Parts, Kitting and Storage		x
	883151.05.05.24	883151.05.05.24	GSFC-Icesat TAMS Light Source		x
	883151.05.06	883151.05.06	GSFC-IceSat Operations Support		x
	883151.05.07	883151.05.07	GSFC-IceSat Post Delivery Support		x
x	883151.06	883151.06	Spacecraft		x
	883151.07	883151.07	Mission Operations		x
	883151.08	883151.08	Launch Vehicle/Services		x
x	883151.09	883151.09	Ground System(s)		x
x	883151.10	883151.10	Systems Integration & Testing		x
	883151.11	883151.11	Education and Public Outreach		x

Cobra CA / Charge Code

- **Some EVM CA were broken down to a lower level to collect costs, e.g. WBS 03 is broken down to 11 Cobra CA / Charge codes to collect costs**
  - Provides better visibility for cost variance analysis; however budgets need to be planned at WP within these 11 Cobra CA / Charge codes
- **Approximately 53 Cobra CA / Charge Codes**

SAP WBS	Cobra WBS	Name	PMT	EVM CA	Cobra CA	harge Cod	Cost Total (Nov10)	Budget K$
883151.03	883151.03	Safety & Mission Assurance		x				9,655
883151.03.01	883151.03.01	GSFC-IceSat SMA Management			x	x	$39,942.30	
883151.03.02	883151.03.02	GSFC-IceSat Quality Assurance			x	x	$58,819.11	
883151.03.03	883151.03.03	GSFC-Icesat Safety			x	x	$70,727.51	
883151.03.04	883151.03.04	GSFC-IceSat Safety & Mission Assurance P			h	ummary		
883151.03.04.20	883151.03.04.20	GSFC-Safety & Mission Assurance Pre-PhA/				y		
883151.03.04.20.01	883151.03.04.20.01	GSFC-ICESAT-II SMA Pre/Phase A				y	$19,667.96	
883151.03.05	883151.03.05	GSFC-IceSat Materials/Processes			x	x	$20,341.97	
883151.03.06	883151.03.06	GSFC-Icesat Parts Engineering			x	x	$109,877.61	
883151.03.06.01	883151.03.06.01	GSFC-IceSat Radiation/ODA/NEPA						
883151.03.07	883151.03.07	GSFC-IceSat Software Assurance			x	x		
883151.03.08	883151.03.08	GSFC-IceSat Reliability Analysis			x	ummary		
883151.03.08.01	883151.03.08.01	GSFC-Icesat Reliability/PRA				y	$18,101.21	
883151.03.09	883151.03.09	GSFC-Icesat Debris/Collision Analysis				y	$747.91	
	883151.03.0A	Enviromental Analysis (Debris, NEPA, Radiation)			x	ummary		
883151.03.10	883151.03.10	GSFC-Icesat NEPA				y		
883151.03.11	883151.03.11	GSFC-Icesat Radiation				y	$18,101.28	
883151.03.12	883151.03.12	GSFC-Icesat SR Process			x	x	$40,532.45	
883151.03.13	883151.03.13	LaRC-Icesat SR Process			x	x		

Actuals - SAP Charge Codes

- **Continue to collect costs at existing charge codes, but levels below Cobra CA / Charge Code level are stripped off prior to import into software tool**

SAP WBS	Cobra WBS	Name	PMT	EVM CA	Cobra CA	harge Cod	WP	Cost Total (Nov10)	Budget K$
883151	883151	ICESat II							
883151.01	883151.01	Project Management		x	x	summary			23,920
883151.01.01	883151.01 01	GSFC- IceSat Project Management				y			
883151.01.01.01	883151.01 01.01	GSFC-IceSat Project Management Support				y		$818,779.45	
883151.01.01.02	883151.01 01.02	GSFC-IceSat Travel				y		$92,864.86	
883151.01.01.03	883151.01 01.03	GSFC-IceSat Training				y			
883151.01.01.04	883151.01 01.04	GSFC-IceSat Logistics				y		$166,791.52	
883151.01.01.05	883151.01 01.05	GSFC-IceSat Risk Management				y		$0.00	
883151.01.01.95	883151.01 01.95	GSFC-IceSat Code 400-500 IT Support				y		$19,122.29	
883151.01.02	883151.01 02	GSFC-IceSat Resources Management				y			
883151.01.02.01	883151.01 02.01	GSFC-IceSat Resources Management Support				y		$1,641,980.97	
883151.01.02.02	883151.01 02.02	GSFC-IceSat Schedule Management				y		$785.00	
883151.01.02.03	883151.01 02.03	GSFC-IceSat Configuration Management				y			
883151.01.03	883151.01 03	GSFC-IceSat Procurement Management				y		$58,237.52	
883151.01.04	883151.01 04	GSFC-IceSat Project Management Pre-Phas				y			
883151.01.04.20	883151.01 04.20	GSFC-Project Management Pre-PhA/Phase A				y			
883151.01.04.20.01	883151.01 04.20.01	GSFC-ICESAT-II PM Pre/Phase A				y		$486,874.57	
883151.01.05	883151.01 05	GSFC-IceSat External Reviews				y		$35,826.38	
883151.01.06	883151.01 06	GSFC-Icesat Laser Facility				y			
883151.01.06.01	883151.01 06.01	GSFC-ARRA-Icesat Facility Construction				y			
883151.01.07	883151.01 07	GSFC-Icesat Instrument Science Support				y		$1,064,680.49	
883151.01.08	883151.01 08	DFRC-Icesat Instrument Science Support				y		$9,675.41	
883151.01.09	883151.01 09	LaRC-IPAO related ICESat SRB Support				y		$31,759.00	
	883151.01.0A	Project Management Support (LOE) Phase A/B	LoE				x		
	883151.01.0B	Project Management Support (LOE) Phase C/D	Plng Pkg				x		

Lower level detail stripped off prior to import to software tool

Actuals collected at existing charge codes

Budget Planning at WP Level

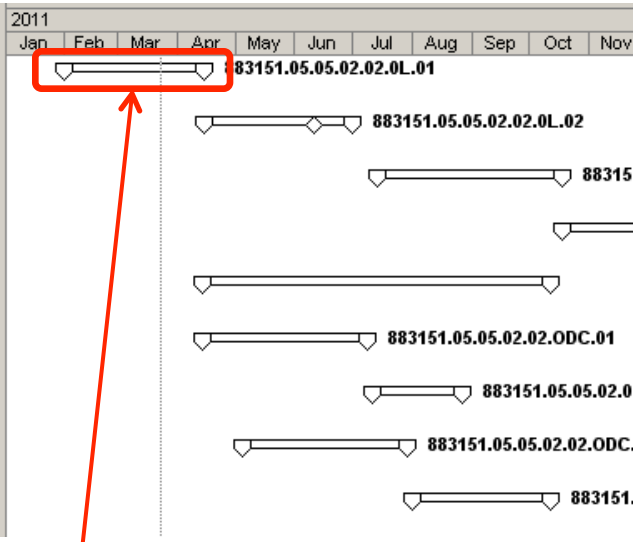
- **Budgets are planned at the WP level – approximately 151 WP / PP**
- **All WP have a Performance Measurement Technique (PMT) or are PPs**
- **WPs do NOT exist in SAP**

SAP WBS	Cobra WBS	Name	PMT	EVM CA	Cobra CA	harge Cod	WP	Cost Total (Nov10)	Budget K$
883151	883151	ICESat II							
883151.01	883151.01	Project Management		x	x	summary			23,920
	883151.01.0A	Project Management Support (LOE) Phase A/B	LoE				x		
	883151.01.0B	Project Management Support (LOE) Phase C/D	Plng Pkg				x		
883151.05.05.02.02	883151.05.05.02.02	GSFC-IceSat Structures		x	x	x		$485,199.54	6,958
	883151.05.05.02.02.0L	Primary Structure Development (Labor)							
	883151.05.05.02.02.0L.01	Preliminary PDR Design and Analysis	M/S				x		
	883151.05.05.02.02.0L.02	Final PDR Design and Analysis	M/S				x		
	883151.05.05.02.02.0L.03	Preliminary CDR Design and Analysis	M/S				x		
	883151.05.05.02.02.0L.04	Final CDR Design and Analysis	M/S				x		
	883151.05.05.02.02.0L.05	Template and Mass Simulator Design & Analysis	M/S				x		
	883151.05.05.02.02.0L.06	MGSE Design	50-50				x		
	883151.05.05.02.02.0L.07	MGSE Analysis	0-100				x		
	883151.05.05.02.02.0L.08	Post CDR Design & Analysis	M/S				x		
	883151.05.05.02.02.0L.09	Harness & FLATLAS Design	50-50				x		
	883151.05.05.02.02.0L.10	Flight Panel Procurement	M/S				x		
	883151.05.05.02.02.0L.11	Post Flight Structure Environmental Testing	M/S				x		
	883151.05.05.02.02.0L.12	Structures Management	M/S				x		
	883151.05.05.02.02.ODC	Primary Structure Development (ODC)							
	883151.05.05.02.02.ODC.01	Coupon Materials	M/S				x		
	883151.05.05.02.02.ODC.02	Coupon Panel Fab	50-50				x		
	883151.05.05.02.02.ODC.03	Coupon Inserts & Tooling	M/S				x		
	883151.05.05.02.02.ODC.04	Coupon Build	M/S				x		
	883151.05.05.02.02.ODC.05	Template and Mass Simulator Fab	M/S				x		
	883151.05.05.02.02.ODC.06	MGSE Fab	M/S				x		
	883151.05.05.02.02.ODC.07	Harness & FLATLAS Fab	M/S				x		
	883151.05.05.02.02.ODC.08	Flight Panel Fab	M/S				x		
	883151.05.05.02.02.ODC.09	Flight Part Fab	M/S				x		
	883151.05.05.02.02.ODC.13	Flight Composite Part Fab	M/S				x		
	883151.05.05.02.02.ODC.10	Flight Panel Insert installation	M/S				x		
	883151.05.05.02.02.ODC.11	Flight Structure Assembly (no FS Assembly)	50-50				x		
	883151.05.05.02.02.ODC.14	Structure ODC (LOE)	M/S				x		
	883151.05.05.02.02.ODC.12	Flight Structure Environmental Testing	M/S				x		

Schedule / Budget Integration

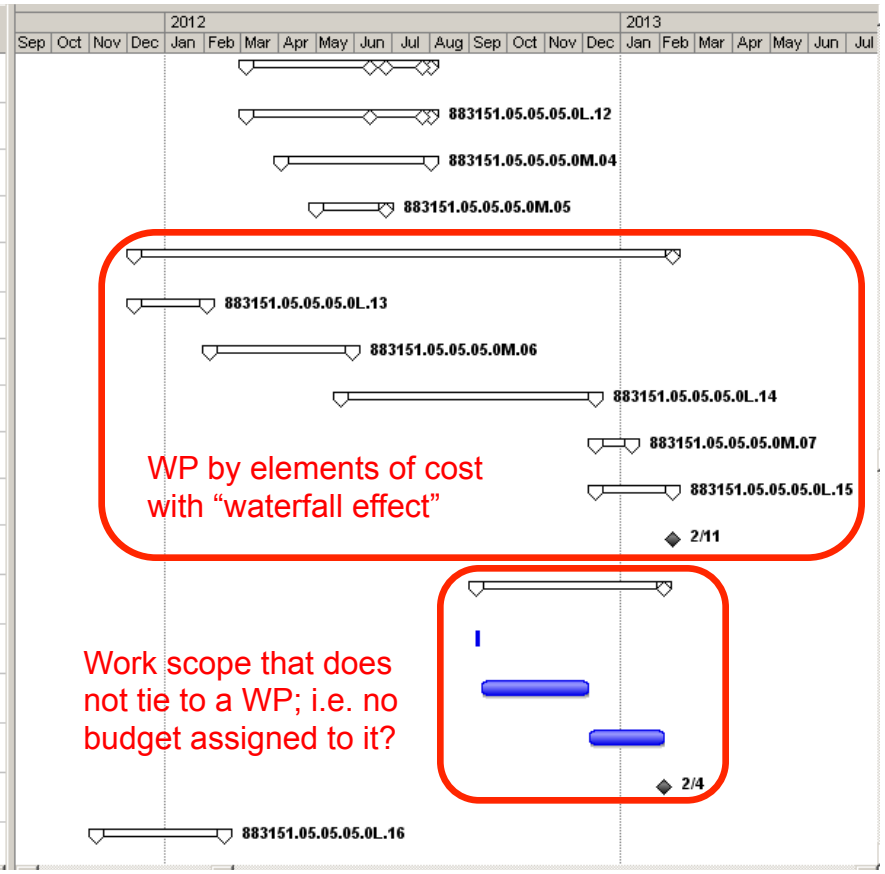
- **Summary tasks in the IMS should be "tagged" with the WP code and the resource / budget spreads should fall within the IMS dates**

WP	PMT	Name	% Complete	Baseline Start	Baseline Finish
883151.05.05.02.02.0L.01	% Cmp	Preliminary PDR Design and Analysis	62%	2/1/11	4/15/11
883151.05.05.02.02.0L.02	% Cmp	Final PDR Design and Analysis	0%	4/15/11	6/30/11
883151.05.05.02.02.0L.03	% Cmp	Preliminary CDR Design and Analysis	0%	7/14/11	10/17/11
883151.05.05.02.02.0L.04	% Cmp	Final CDR Design and Analysis	0%	10/18/11	5/23/12
		Coupon Design & Development	0%	4/14/11	10/11/11
883151.05.05.02.02.ODC.01	% Cmp	Coupon Materials	0%	4/14/11	7/8/11
883151.05.05.02.02.ODC.02	50-50	Coupon Panel Fab	0%	7/11/11	8/26/11
883151.05.05.02.02.ODC.03	% Cmp	Coupon Inserts & Tooling	0%	5/5/11	7/29/11
883151.05.05.02.02.ODC.04	% Cmp	Coupon Build	0%	8/1/11	10/11/11



Program: ICESATAB ICESAT2 Phase A/B			Class: CB		JAN 2011	FEB 2011	MAR 2011	APR 2011	MAY 2011	JUN 2011	JUL 2011	AUG 2011
Cost Account	Work Package	BE	Start	Finish								
883151.05.05.02.02			01-Feb-11	30-Apr-13								
	883151.05.05.02.02.0L.01 : Prelim PDR Dsgn & Anly		01-Feb-11	30-Apr-11								
		CS-EN30	FTE			0.65	0.65	0.65				
		CS-TE30	FTE			0.5	0.5	0.5				
		CT-EN30	FTE			2.9	2.9	3.8				
	883151.05.05.02.02.0L.02 : Final PDR Dsgn & Anly		01-Apr-11	30-Jun-11								
		CS-EN30	FTE					0.3	3	0.55		
		CS-TE30	FTE					0.5	0.5	1		
		CT-EN30	FTE					1.9	1.9	3.8		
	883151.05.05.02.02.ODC.01 : Coupon Materials		01-Apr-11	31-Jul-11								
		SUBCONTRACTS	TCOST					15000	25500	17000	8500	

Future Construct Work

- Future planning (e.g. non-baseline CA) should develop discrete WP similar to the structure below by logically grouping work scope
- If possible, charge numbers should be driven lower in the structure to allow better cost variance visibility
- Improvements in the IMS should have all work scope associated to a WP

WP	PMT	Name
		⊟ FM Heaters, Sensors, and Tstats
883151.05.05.05.0L.12	% Cmp	⊞ Specify Heaters, Sensors, and Tstats
883151.05.05.05.0M.04	% Cmp	⊞ Procure Heaters, Sensors, and Tstats
883151.05.05.05.0M.05	50-50	⊞ Build and Install MLI
		⊟ FM Thermal Hardware I&T
883151.05.05.05.0L.13	50-50	⊞ Design Thermal Hardware Test Fixture
883151.05.05.05.0M.06	% Cmp	⊞ Build Thermal Hardware Test Fixture
883151.05.05.05.0L.14	% Cmp	⊞ Assemble Thermal Hardware Test
883151.05.05.05.0M.07	0-100	⊞ Thermal Hardware Test
883151.05.05.05.0L.15	50-50	⊞ Thermal Hardware Test Labor and Correlation
		(Del) Thermal H/W to Atlas FM Instrument I&T
		⊟ ATLAS Instrument TVAC Test Hardware
		Point of Departure for TVAC Test Hardware Design
		T-Vac Hardware Fixture Design
		T-Vac Hardware Fixture Fabrication
		(Del) TVAC Hardware to ATLAS I&T
883151.05.05.05.0L.16	% Cmp	⊞ FLATLAS Thermal Simulator