Neu Dimension
Your Integrated Solutions Partner

UMT Power Estimation

By Ikram Muslim

TYPE OF BATTERY

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Parameter	Specifications						
	BAT003	BAT004	BAT005	BAT007	BAT009	BAT010	BAT013
Connection Type	Sondex Threaded Ends	Sondex Threaded Ends	Two Flying Leads[a]	Two Flying Leads[a]	Sondex Threaded Ends	Sondex Threaded Ends	Sondex Threaded Ends
Electrochem Cell Type	PMX150C (Series: 3B3700)	25-48-180MR (Series: 4266)	PMX150C (Series: 3B3700)	PMX165C (Series: 3B5100)	PMX165C (Series: 3B5100)	PMX165CC (Series: 3B5200)	PMX165CC (Series: 3B5200)
Performance Rate	High	Moderate	High	High	High	High	High
Battery Cell Size	C	C	C	C	C	CC	CC
No of cells per battery pack	5	5	5	5	5	5	10
Cell Chemistry	Lithium Sulfuryl Chloride	Lithium Thionyl Chloride	Lithium Sulfuryl Chloride	Lithium Sulfuryl Chloride	Lithium Sulfuryl Chloride	Lithium Sulfuryl Chloride	Lithium Sulfuryl Chloride
Cell Open Circuit Voltage	3.93V	3.67V	3.93V	3.93V	3.93V	3.93V	3.93V
Battery Pack Open Circuit Voltage	19.5V	19V	19.5V	19.5V	19.5V	19.5V	19.5V
Operational Temperature Range	-20°C to 150°C	+50°C to 180°C	-20°C to 150°C	-20°C to 165°C	-20°C to 165°C	-20°C to 165°C	-20°C to 165°C
Battery Pack Rated Capacity	6.2Ah	5.0Ah	6.2Ah	6.2Ah	6.2Ah	13Ah	26Ah
Maximum Continuous Current	500mA	100mA	500mA	500mA	500mA	500mA	1000mA
Suitable Memory Battery Holders	MBH014 MBH024 & 25 MBH030, 31 & 33	MBH014 MBH024 & 25 MBH030, 31 & 33	MBH018 (for DBT)	MBH018 (for DBT)	MBH014 MBH024 & 25 MBH030, 31 & 33	MBH025 MBH033	MBH028

[a] Banana Male and Burndy Female Connector.

POWER ESTIMATION

STEP BY STEP

Battery Information		
Battery Type	Electrochem	
Power Rating		Ampere Hrs
Capacity Factor		%
Available power	0	mAH
Self Drain per day		%

Capacity Factor Table, %		
Electrochem	165 deg C	180 deg C
Capacity	6.0 Ah	4.5 Ah
Ambient	70	70
50 deg C	80	80
100 deg C	70	80
150 deg C	80	90

1st Step, fill up battery information which battery type and power rating can be found via its specification. For capacity factor, estimate the allowable value as for safety margin in order to avoid any problems. Every battery have their own self drain. Self drain is related to downhole temperature, for lithium batteries it is too low. Usually just give it for 1%.

POWER ESTIMATION

STEP BY STEP

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Next, fill up what type of tools used prior to logging services conducted. Amount of tools used depends on our toolstring when running the job.

TOOL:	UMT	MIT	MTT	PRT	QPC	QPS	RAT	SAT	PAI	CAT	CCL	ILS	PGR	FDR	FDI	PDC	HTU	DBT	PIA	CTF	CWH	RBT	Total
CURRENT:	21	25	160	15	20	12	80	15	180	25	10	7	20	25	35	24	19	15	26	33	16	55	Current,mA
TOOLS USED:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SLEEP/SETUP:	SLEEP	MOTOR	TRANS		*This spreadsheet is to be used as a guide only. As battery life is dependent upon so many variables.*																		
CURRENT:	4	500	400		*Sondex cannot be held liable for consequences resulting from it's use.*														Total Profile Length (hrs)				0.0

POWER ESTIMATION

STEP BY STEP

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UMT Start Time	Profile Length	Command
Date/Month/Year	Minutes	UMT Command
24hr Clock		
22/3/2016 23:15		Log
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15		Sleep
22/3/2016 23:15	Profile End Time	

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Enter date and tool start time when the job is running. As input inserted in UW memlog profile, fill up how long it going to take for each command give either log, sleep, open or close. Addition, this information can also be extract from the sequence of event according to type of services conducted.

POWER ESTIMATION

STEP BY STEP

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Results:		
	mAhr	%
Total Available	0.0	#DIV/0!
Total Used	0.0	#DIV/0!
Self Drain	0.0	#DIV/0!
Total Left	**0.0**	**#DIV/0!**

As a result, take total profile length (hours) and total current used for calculation so that we know how much power has been used. Every battery has their own available power. By considering total current used and self drain, it can compute total power left. From there we know either that batteries is sufficient enough or not to use for the job.

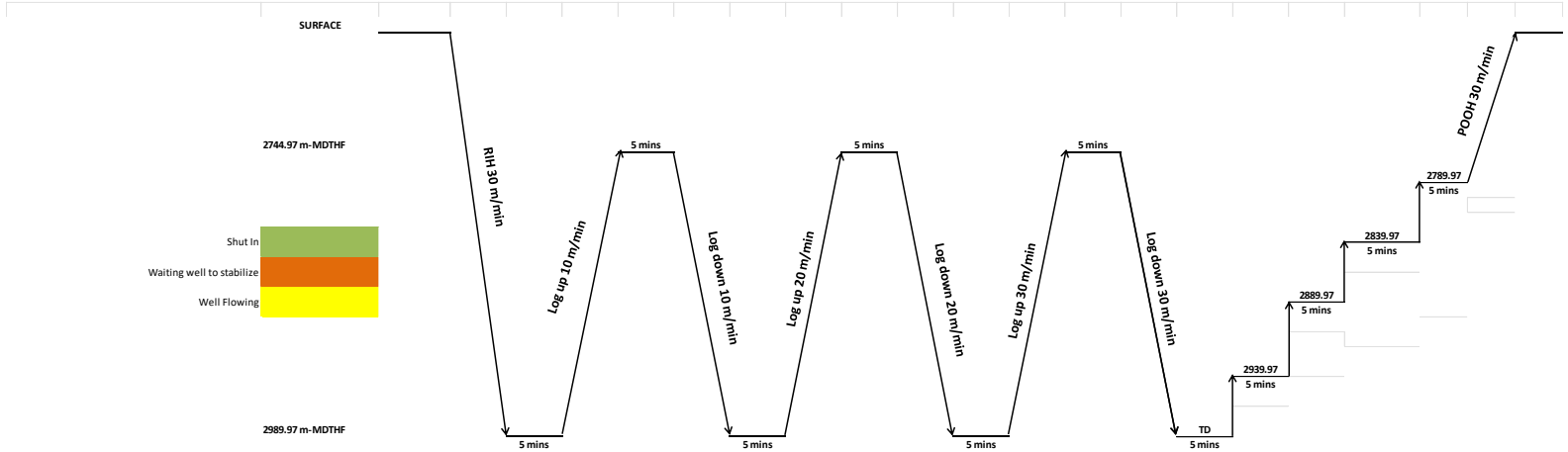
Total Profile Length (hrs)	0.0

V1.00 23 Sep 2006 A Boyter

Total	Power Used	Cumulative
Current	mAH	mAH
0	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
4	0.00	0.00
Power Used:		0.00

EXAMPLE OF JOB

MPLT – SHUT IN



This is the sequence of event for MPLT – Shut In condition with 3 different logging speed which are 30 ft/min, 60 ft/min & 90 ft/min (10 m/min, 20 m/min & 30 m/min). Total running hours for this condition is approximately 9 hours. For batt 003, maximum hours it can operate is 31 hours at 1 second sampling with 10 sensors taking 160mA.

LOGGING SURVEY ESTIMATION PERIOD			
TOP LOGGING DEPTH:			2744.97 m-MDTHF
BOTTOM LOGGING DEPTH:			2989.97 m-MDTHF
LOGGING INTERVAL			245 m-MDTHF
RIH/POOH SPEED:			30 m/min
LOGGING SPEED:			
1st LOGGING SPEED (UP/DOWN)			10 m/min
2nd LOGGING SPEED (UP/DOWN)			20 m/min
3rd LOGGING SPEED (UP/DOWN)			30 m/min
Stationary Stop / Duration (MINS)			
	5	2789.97	m-MDTHF
	5	2839.97	m-MDTHF
	5	2889.97	m-MDTHF
	5	2939.97	m-MDTHF
RIG UP MPLT			60 mins
RIH TO BOTTOM LOGGING DEPTH			100 mins
LOG UP 30 ft/min			25 mins
LOG DOWN 30 ft/min			25 mins
LOG UP 60 ft/min			12 mins
LOG DOWN 60 ft/min			12 mins
LOG UP 90 ft/min			8 mins
LOG DOWN 90 ft/min			8 mins
STOP 5 MINS EACH BEFORE LOGGING			35 mins
POOH TO 1st STATIONARY STOP			5 mins
POOH TO 2nd STATIONARY STOP			5 mins
POOH TO 3rd STATIONARY STOP			5 mins
POOH TO 4th STATIONARY STOP			5 mins
TOTAL TIME STATIONARY STOPS			20 mins
INSURANCE			60 mins
POOH TO LUBRICATOR			93 mins
RIG DOWN MPLT			60 mins
TOTAL TIME			**537 mins**
		@	**9 hours**

EXAMPLE OF JOB

MPLT – SHUT IN

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Battery Information		
Battery Type	Electrochem	
Power Rating	6.2	Ampere Hrs
Capacity Factor	80	%
Available power	4960	mAH
Self Drain per day	1.0	%

Results:		
	mAhr	%
Total	4960.0	100.0
Total Used	3990.0	80.4
Self Drain	62.0	1.3
Total Left	908.0	18.3

TOOL:	UMT	MIT	MTT	PRT	QPC	QPS	RAT	SAT	PAI	CAT	CCL	ILS	PGR	FDR	FDI	PDC	HTU	DBT	PIA	CTF	CWH	RBT	Total
CURRENT:	21	25	160	15	20	12	80	15	180	25	10	7	20	25	35	24	19	15	26	33	16	55	Current,mA
TOOLS USED:	1	0	0	1	0	1	0	0	0	0	1	2	1	1	0	0	0	0	0	0	1	0	133
SLEEP/SETUP:	SLEEP	MOTOR	TRANS		*This spreadsheet is to be used as a guide only. Battery life is dependent upon many variables.*																		
CURRENT:	4	500	400		*Sondex cannot be held liable for consequences resulting from its use.*																		

Total Profile Length (hrs)	30.0

V1.00 23 Sep 2005 A Peplow

UMT Start Time	Profile Length	Command
Date/Month/Year	Minutes	UMT Command
24hr Clock		
22/3/2016 23:15	1800	Log
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15		Sleep
23/3/2016 5:15	Profile End Time	

Capacity Factor Table, %		
Electrochem	165 deg C	180 deg C
Capacity	6.0 Ah	4.5 Ah
Ambient	70	70
50 deg C	80	80
100 deg C	70	80
150 deg C	80	90

Instructions:

Enter Battery Information, Estimate capacity factor allowing for a Safety margin.

Self drain is related to downhole temperature. For Lithium batteries it is low.

Enter Tool Type, Tools used and Tool Current as in the final test records

Enter Date and Tool Start time

Enter profile length minutes and Command as in UW Memlog profile.

Computed answers are highlighted in yellow

Total	Power Used	Cumulative
Current	mAH	mAH
133	3990.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
4	0.00	3990.00
Power Used:		3990.00

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Thank you !

Questions and Answering Session

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