

UMT Power Estimation

By Ikram Muslim

TYPE OF BATTERY

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	CC	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.

Downhole Battery Pack

BAT

POWER ESTIMATION

STEP BY STEP

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

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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%.

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

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

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.

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POWER ESTIMATION

STEP BY STEP

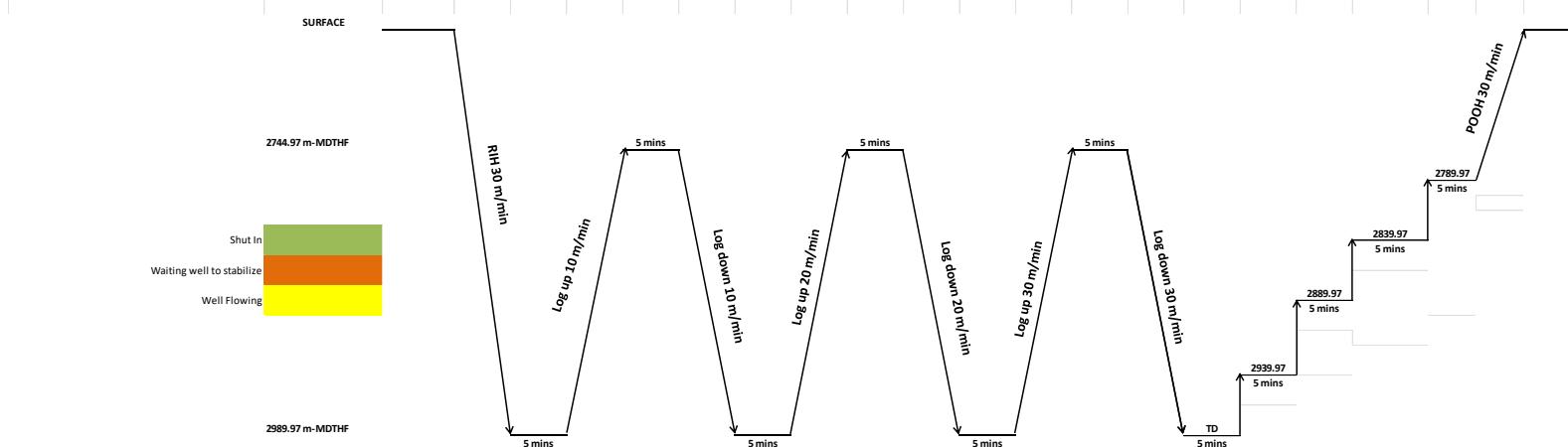
Results:		
	mAhr	%
Total Available	0.0	#DIV/0!
Total Used	0.0	#DIV/0!
Self Drain	0.0	#DIV/0!
Total Left	0.0	#DIV/0!

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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.

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

Battery Information

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

TOOL:	UMT	MIT	MTT	PRT	OPC
CURRENT:	21	25	160	15	20
TOOLS USED:	1	0	0	1	0
SLEEP/SETUP:	SLEEP	MOTOR	TRANS		Thinner
CURRENT:	4	500	400		Soaker

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, Tool wear and Tool Current in the final test records

Enter Date and Tool Start time

Enter profile length minutes and Command or in UW Memq profile.

Computed answers are highlighted in yellow

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

DBT	PIA	CTF	CWH	RBT	Total Current, mA
15	26	33	16	55	
0	0	0	1	0	133
Total Profile Length (hrs)					30.0

Thank you !

Questions and Answering Session

Prepared by,



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Date :

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