Neu
Dimension
Your Integrated Solutions Partner

MIT Programming (EMITE)

By Clement Emang

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Introduction to MIT

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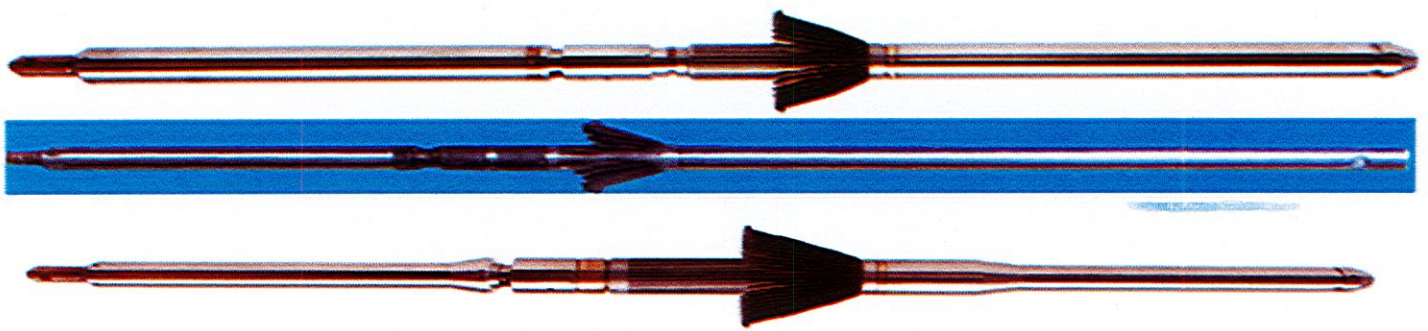
- Multifinger Imaging tool (MIT) is designed to proved the most accurate tubing caliper measurements.
- The data allows for 3 dimensional imaging and the calculation of rates of corrosion or scale deposition
- Dimension bid has 2 types of MIT, MIT24F & MIT40F



Tool Specification

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Mechanical	MIT24F	MIT40F
Outside Diameter	1-11/16"	2-3/4"
Make up Length	50.6"	54.4"
Housing Material	Inconel 718 / Stainless Steel 17-4	
Finger Lengths	7"	7" and 10"
Number of Fingers	24F	40F
Radial Accuracy	±0.02"	±0.025" (7") ±0.03" (10")
Radial Resolution	0.003"	0.005"(7") 0.007"(10")
Measurement Range	1-3/4"(Min) 7"(Max)	2.75"(Min) 10"(Max)
Circumferential Spacing	0.23"(Min) 0.92"(Max)	0.25"(Min) 0.92"(Max)
Finger Tip Radius	0.05"	0.06"
Finger Tip Width	0.063"	0.04"
Finger Contact Force	0.75lbs(Min) 1.25lbs(Max)	
Logging Speed	30ft/min(Min) 60ft/min(Max)	
Environmental		
Pressure Ranges	Up to 15,000 psi	Up to 20,000 psi
Temperature Rating	177°C (351°F)	
Electronic		
Current Consumption	Logging <30mA Motor <400mA	

WELL INFO

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- Well schematic
- Well history
- OHGR
- Tubing Tally
- Pressure and Temperature

MIT Toolstring

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- Standard MIT toolstring for memory job consist of:-
  1. ULTRAWIRE MEMORY TOOL, UMT
  2. PRODUCTION KNUCKLE JOINT, PKJ
  3. PRODUCTION ROLLER CENTRALISER, PRC
  4. MULTIFINGER IMAGING TOOL, MIT
  5. PRODUCTION ROLLER CENTRALISER, PRC
  6. BULLNOSE WITH TERMINATOR, BUL

MIT CHECKLIST

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MIT SSP CHECKLIST

At Base: Design & Prepare		
Design	Client has provided the well information, confirmed the number of run, logging interval and signed the work program.	☐
	Confirm the operation is within tool specifications.	☐
	Client already been informed on the limitation of the tools, equipment, well condition and etc.	☐
	Ensure availability of the required tool configurations.	☐
Prepare	Discussed with CMS FSM on the availability of the MIT Tools.	☐
	For X-Over, discussed with SLS FSM or OE on the availability and functionality.	☐
	Prepare all the tools and accessories as per maintenance manual. Verify with the lab side on the maintenance.	☐
	Ensure all the consumables, spare parts, hand tools, and programming tools are already in the package.	☐
	Prepare Sondex Software (Refer to Op-Check Checklist).	☐
	Perform MIT Opcheck (Refer to Op-Check Checklist).	☐
At Well Site: Execute		
Rig Up	Confirm well and hole properties with Wireline Supervisor. Review well history.	☐
	Make sure the well is stable and has been shut in for specific duration depending on the job program.	☐
	Ensure tubing clearance is conducted prior to RIH MIT Tools.	☐
	Perform MIT Opcheck (Refer Opcheck Checklist).	☐
	Prepare Sequence of Events (SOE) corresponding to the designed logging interval.	☐
	Program UMT and duration accordingly.	☐
	Make-up MIT toolstring as per program.	☐
	Ensure FIT for X-Over from SLS/CTU/E-Line to MIT Tools.	☐
	Hook-up battery and record MIT initiation time.	☐
	Zero toolstring (CRP for MIT is at Finger) at Tubing Head Flange (THF).	☐
MIT Run	Perform MIT Caliper survey run as per SSP.	☐
	RIH with average speed of 30m/min to set depth.	☐
	POOH to surface at 10m/min, not exceeding 18 m/min.	☐
Post Job	Clean the tool during rig down while it hangs out from lubricator.	☐
	Rig down toolstring and retrieve MIT Tools.	☐
	Download data and perform data QA/QC as per SSP	☐
	Perform After Job Calibration as per SSP	☐
	Perform post job maintenance on MIT Tools	☐
	Submit the Quick Look Report and Raw Data to Client and Log Analyst	☐
Return to Base: Close		
	Arrange de-mobilization of the equipment back to base.	☐
	Complete Post Job Maintenance and Reporting	☐
	Submit any lessons learnt and improvement suggestion to FSM.	☐
	Attend debriefing with FSM.	☐
Name:	write your name here	
Date:	dd/mm/yyyy **Signature:**	sign here

MIT OP-CHECK CHECKLIST

PPS SmartView		
Software	Computer operating system no older than Windows 2000, 32bit for W7 and 64 bit for W8	☐
	Latest Warrior and Sondex Memlog Software is installed (Emeraude Software is optional).	☐
	Ensure correct Warrior Key License entered.	☐
	No error while launching and operating the software	☐
	Check MIT tool have up to date calibration	☐
Lithium Battery		
De-passivate	Check the battery condition received	☐
	Check the battery voltage using multimeter (reading should be >19V)	☐
	De-passivate battery (if the voltage less than 14V)	☐
	Replace the battery if the voltage reading is still below than 14V (minimum requirement is 14V)	☐
	For DTR, check the D-cell battery power and replace if it is low.	☐
MIT Tools		
Bench Test	Connect MIT Tools with laptop through USB UMU002 and launch Sondex Ultrawire Memlog and Acquisition	☐
	Check communication between laptop with UMT/DTR. Make sure no error while communicating.	☐
	Synchronize the DTR time with laptop. Recommended to synchronize with FE personal watch	☐
	Ensure correct/calibrated wheel circumference entered in DTR. Check the unit used same with wireline unit	☐
	Test DTR and Encoder by rotating the shaft	☐
	Hook up encoder and splitter to angle drive on wireline unit. Ensure encoder in correct position to avoid pin parted	☐
	Ensure the correct serial number and layout added in toolstring configuration	☐
	Check the functionality of the MIT Tools as per SSP and verify the output	☐
	Program the MIT Tools for calibration as per SSP	☐
	Hook-up battery to the MIT Tools. Ensure the sound 'Bip' at the UMT or observed fingers is opening	☐
	Perform MIT Calibration as per SSP	☐
	Apply vibration/shock test on MIT Tools	☐
	Download data from UMT and perform calibration step as per SSP	☐
	Perform QA/QC based on the results obtained.	☐
	Record and document the bench test results	☐
Name:	write your name here	
Date:	dd/mm/yyyy **Signature:**	sign here

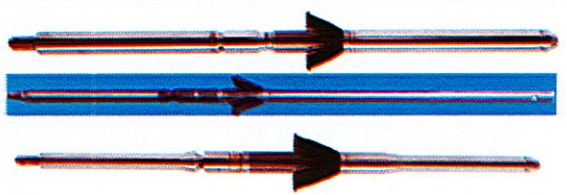
MIT FIT CHECKLIST

OBJECTIVE

i - To conduct Fast Inspection of Tools (FIT) prior to performing job

ii - To identify any anomalies/possible damage after run

TOOL DIAGRAMS



PRE JOB	
1. Make sure the selected MIT Tools tagged green "Ready to Go" indicating already completed maintenance process	☐
2. Perform physical check on the tools received. Perform continuity and leak test	☐
3. Inspect the O-ring conditions. Replace if necessary. Ensure to use HNBR O-ring for sour wells	☐
4. Apply O-ring grease	☐
5. Use air gun or WD-40 and spray the sensor to clean any dirt and debris	☐
6. De-passivate battery and bench test MIT Tools (refer Op-Check Checklist)	☐
7. Test every tool and equipment such as join cross over to ensure the compatibility and in good condition	☐
8. Record tool and battery serial number	☐
9 Perform Field Calibration and fullstring bench test	☐
POST JOB	
1. Clean the tool before disconnecting toolstring. Ensure the MIT Tools is clean from debris, dirt, and grease	☐
2. Observe for any anomalies/possible damage	☐
4. Inspect O-rings conditions. Replace if needed	☐
5. Clean O-ring groove	☐
6. Perform after job calibration	☐
7. Fill up Tool Utilization Record and EMITE Battery Tracking Form	☐
Name:	write your name here
Date:	dd/mm/yyyy **Signature:** sign here

PRE CALIBRATION

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- To calibrate MIT finger before the run
- Make sure that the finger are all functioning
- Can be done separately from the program

MIT PROGRAMMING

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- To estimate the duration of run
- Time management
- Make sure to put extra 10/15 min for each section(open/close) to ensure that the finger is fully open or fully close.
- Make sure to set 'setup' after 'open'

POST CALIBRATION

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- To determine the offset of the finger after logging by comparing it with the Pre-calibration
- Finger offset should be less the 0.002
- Make sure the finger is clean (without any debris) before starting the post calibration
- Can be done separately from the program

Required Data

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- Below are the list of data to be send to Log Analyst after each run
  1. .psc
  2. .24f
  3. .db
  4. Field Quicklook with corrected log in .pdf

EXAMPLE OF JOB

MIT-NO REPEAT SECTION

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MEMORY MIT PROGRAM NO REPEAT SECTION
(Corrosion/Scale Monitoring Tool)

Well Name: B-025
DATE: 30-Jun-14

6302.842

Start Time
8:00:00 AM

VARIABLES	
Main Log Bott. Depth:	11447 ft
Main Log Top Depth:	350 ft
R.I.H. Speed:	120 ft/min
Logging Speed:	30 ft/min
Tool Data Rate:	3381.42 Bytes/s

Depth resolution = 0.082 ins
= 2.082 mm
Tool Type (24 or 40 only) = 24

*Changeable Items are BOLD and COLOURED BLUE

24-Finger 2.11/16" tool: 3381.22 Bytes/s 73 readings/sec
40-Finger 2.11/16" tool: 4009.08 Bytes/s, 33 Readings/Sec

Tool Instruction: M=OPEN, N = CLOSED

Job Sequence	Program	Divisor	Position	Time mins	Bytes	Total Mem.	Cummulative Mins	Cumul Time	Tool Program	Real Time	Action
Tool Check/ Pre Srv. Cal.	M	30	Open	10.0	101,493	101,493	0.0	0:00:00	0:00:00	8:00:00 AM	Tool Opens
Start Rig Up	N	73	Closed	30.0	83,387	184,842	10.0	0:10:00	0:10:00	8:10:00 AM	Tool Closes
R.I.H	N	73	Closed	96.0	266,839	451,681	40.0	0:40:00		8:40:00 AM	Start RIH
RIH Insurance (Spare)	N	73	Closed	15.0	41,694	493,375	136.0	2:16:00		10:16:00 AM	
OPEN	M	1	Open	3.0	608,728	1,102,103	151.0	2:31:00	2:31:00	10:31:00 AM	Time Tool Opens
Main Log	M	1	Open	370.0	73,076,404	74,178,507	154.0	2:34:00		10:34:00 AM	Start Main Log
M/L Insurance (Spare)	M	1	Open	15.0	3,042,639	77,222,149	524.0	8:44:00		4:44:00 PM	
CLOSE	N	73	Closed	3.0	8,339	77,230,483	539.0	8:59:00	8:59:00	4:59:00 PM	Time Tool Closes
POOH	N	73	Closed	3.0	8,339	77,238,822	542.0	9:02:00		5:02:00 PM	Start POOH
Start Rig Down	N	73	Closed	0.0	0	77,238,822	543.0	9:03:00		5:03:00 PM	Rig Down
Post Survey Calibration	M	30	Open	0.0	0	77,238,822	543.0	9:03:00	9:03:00	5:03:00 PM	Time Tool Opens
End of Job				543.0	77,238,822		543.0	9:03:00	9:03:00	5:03:00 PM	Tool Closes / End

Memory Size Maybe Exceeded - Check by Programming Tool
Equipment Cleaning, Download and Data Verification + Packing: 1 hour

Tool Memory Size , KB 65535
Available Memory in Bytes 67107840

Start Time (HH:MM:SS)	Start Time (HH:MM:SS)	Profile Length (mins)	Tool Name / UW Address / Default Rate / Profile Type	UMT / 0 / 1 / Rate	MIT / 15 / 0.02 / Rate
8:00:00 AM	0:00:00	3.0	Open		
8:03:00 AM	0:03:00	7.0	Log Open	1	0.02
8:10:00 AM	0:10:00	3.0	Close		
8:13:00 AM	0:13:00	99.0	Log Close	1	0.02
9:52:00 AM	1:52:00	3.0	Open		
9:55:00 AM	1:55:00	385.0	Log Open	1	0.02
4:20:00 PM	8:20:00	3.0	Close		
4:23:00 PM	8:23:00	20.0	Log Close	1	0.02
4:43:00 PM	8:43:00	0.0	Open		
4:43:00 PM	8:43:00	0.0	Log Open	1	0.02
4:43:00 PM	8:43:00	0.0	Close		

Open	3.0	* Fill in
Log Open	7.0	
Close	138.0	
Log Close	3.0	* Fill in
Open	3.0	
Log Open	385.0	
Close	6.0	
Log Close		* Fill in
Open		* Fill in
Log Open	0.0	
Close		* Fill in

POWER ESTIMATION

STEP BY STEP

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UMT Start Time Date/Month/Year 24hr Clock	Profile Length Minutes	Command UMT Command
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	

1

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 Current	Power Used mAH	Cumulative 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**

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Thank you !

Questions and Answering Session

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