Director’s Comments

The AF published a “Future Operating Concept” as a guide to help identify how airpower may be employed in 10-15 years. If we take this vision and employ it today, we can help begin prepositioning the fielded TMDE and PMEL processes in a manner that will best support that future operating concept. So what is the focus of AF Future Operating Concept?

Not surprisingly, the overall key is operational agility, “the ability to rapidly generate—and shift among—multiple solutions for a given challenge.” This agility comes from a combination of five separate factors; Flexibility, Speed, Coordination, Balance, and Strength. Without defining each term, it is still easy to see how improving maintenance operations in these areas is good for the AF.

As your MAJCOM Functional Managers (MFM)s prepare to come to AFMETCAL in Nov 17, we should be looking for ideas and ways to improve our operations. Using the five factors noted above may form a good framework or question set to help spur thought and innovation. Would be delighted to have the MFM’s arrive for our Nov meeting with a list of suggested initiatives to consider. Who better to suggest ways to improve operations than the people who live it daily? Up channel your good ideas. We’d be happy to consider them.

A few areas of interest have caught my attention. Speed, flexibility, and balance may be hindered by TMDE that requires very short calibration cycles. Low reliability or short cal devices reduce operational availability, increase fleet size, cost, and manpower both inside the squadron and in the PMEL. I’d like to look at these items and see if there are better alternatives. Maybe better tools with higher reliability and longer cal cycles can be acquired to support a more agile future AF… in the not so distant future.

Along these same lines, as new equipment is delivered to the PMELs and the field, we’ll need the old assets/systems to be removed from service.

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Disclosure & Editorial Policy

Disclosure: The Air Force Metrology and Calibration (AFMETCAL) Program Newsletter is published on a triannual basis (Mar, Jul, Nov) by the AFMETCAL Division (AFLCMC/WNM), Plans & Analysis Section (AFLCMC/WNMRX), 813 Irving-Wick Drive W, Heath, Ohio 43056-1199.

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Editorial Policy Statement: The AFMETCAL Quarterly Newsletter is the AFMETCAL Director’s forum to share insights into policy and emerging trends, personnel news, technical and other information of interest to the Air Force metrology community at large. Newsletter articles cover many topics: technical issues; clarifications of policies/procedures; process improvements; and items of general interest about Air Force metrology community members.

Submissions: We encourage readers to submit articles for the following categories: From the Bench (technical), About People (field personnel news), News & Notes (general information). Submissions should be in Microsoft Word, Times New Roman 12 font, accompanied whenever possible by digital photos in JPEG format. Native photo file sizes less than 2MB per image are preferred. Photos must be accompanied with caption information which fully identifies all individuals depicted, including rank, title or office, and event. Note that all text and photo submissions are subject to editing for content, cropping and/or size. All submissions that are technical in nature are reviewed by the AFMETCAL Engineering Branch (AFLCMC/WNME) for accuracy and appropriateness. Publication of any submission, regardless of subject matter, will be approved by the AFMETCAL Division and submission does not guarantee publication. All submissions are reviewed for compliance with Privacy Act, FDO, STINFO, OPSEC and other information security requirements as applicable.

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Director, Air Force Metrology & Calibration
Mr. Neil B. Erno

Editor:
Bob Nappier

Assistant Editor:
Lee Wood
Director’s Comments (continued)

(Continued from page 1)

Cyber security risks and sustainment costs drive us to consider replacing assets. Keeping fleet configurations to an acceptable minimum helps create operational agility and reduce sustainment costs. Again, hard to see how this isn’t good for the AF. Let’s look around us to see if there are old systems still in use that maybe should be retired. Old hardware and software can present unacceptable risks to our AF. Do these older, more familiar systems represent security risks not present in the new devices AFMETCAL procured? Seems likely. I look forward to working with the larger team to identify and resolve these sort of issues as they surface and appreciate your assistance in that effort.

As always, I want to thank you for all you do to help support the warfighter and keep this the most capable and respected AF. We each have a part to play and we can’t do it without you. I look forward to hearing your ideas/initiatives on how to do still better in the future.

Cheers,

NEIL B. ERNO
Director, Air Force Metrology & Calibration
AFLCMC/WNM

Chief’s Corner

So 4 months into the job and not surprisingly, it’s been busy and rewarding at the same time. After just 2 weeks on the job, we started the AFPSL Assessment and the team ended up running over 35 items, and ultimately recommending Certification to the AFMETCAL Director. I traveled with the Evaluation Team Superintendent, SMSgt Stevens, to the Pentagon to attend a few meetings and complete my Career Field Manager (CFM) training. We (the 2P Chiefs) finalized our Enlisted Development Team (EDT) vectors and are now putting the final touches on the documentation. I have been working with our Training Managers and the Occupational Analysis folks at AETC to prepare for our Utilization & Training Workshop (U&TW). And this week, I am with the Evaluation Team to assess the Wright Patterson PMEL.

I’d be remiss if I didn’t mention my trip last month to assess the Mountain Home PMEL and my opportunity to spend some quality time with two of our former AFMETCAL Evaluators. “Tis better to give, than to receive”…took on a whole new meaning here. In all seriousness though, I was able to see first-hand, a PMEL leadership team comprised of three SNCOs who each filled 2P developmental positions at some point in their careers (AFMETCAL, ACC/AMIC, and the Schoolhouse), and they are now able to leverage those unique skills and perspectives to lead the next generation of our 2P Airmen. That is the intent of filling an EDT or Developmental Special Duty (DSD) position…go off, get developed and bring that breadth of experience back to the 2P community. This is certainly no knock against those who never make it back to the field (timing and opportunity matters), but in (Continued on page 4)
Chief’s Corner (continued)

(Continued from page 3)

our future EDTs and DSD quotas, one of our goals will be to maximize the return on investment of our Airmen filling these positions.

Before I move on to discuss a few things with the recent TO 00-20-14 release, let me give you a quick update on my focus areas:

1) Utilize Continuous Process Improvement tools to enhance our evaluations (virtual and on-site) and the overall Certification process. In July 2017, SAF/IGI, the AF IG Working Group, and TIG (Lt Gen Rock) approved PMEL to officially move from AFI 90-201 (AF Inspection System) Attach 3 to Attach 2. Essentially, this means we will be our own certification body and no longer be fully integrated with the MAJCOM IGs. More to come on our future state in the next Newsletter Article, but we will continue to perform risk-based sampling and we will integrate occasionally with the IG when feasible (we are going back to some form of regional alignment to save some TDY money). Our main focus will be the PMEL’s ability to perform safe, accurate, reliable, and traceable measurements through an effective Management System (MS) and Quality Program (QP). And spoiler alert…we may move towards certifying measurement areas versus a blanket certification. To be continued…

2) Improve AFIS sampling strategy and assessment feedback by improving Eval Team synergy with MFMs, AMIC, Repair Network Managers, and AFMETCAL Engineers. We have added AMIC CORs and PMs to our Sampling Strategy meetings and so far it has had positive results. We are in the process of improving our Assessment Reports and QP/MS Feedback documents and you should see an immediate difference in the Feedback session (yes, I listened to the feedback and suggestions emails you have been sending to me…and keep them coming). A few weeks ago, we test-drove an idea to share with the PMELs the “why” of each item we sampled. It was highly appreciated in the PMELs so far, and based on the positive feedback we’ve received, we will discuss some of our Sampling Strategy with the PMELs at the end of your Assessment. As I stated before, everyone from the youngest technicians to our MFMs, AFMETCAL Evaluators, and AMIC CORs should be able to assess the risk of a PMEL to some degree of consistency. This is just one step towards making that a reality.

3) Deliberately develop our PMEL Airmen and improve our career field training. If you are a TSgt or above and did not receive an EDT worksheet, please let me know. Now that we are 99% done with this year’s EDT, we will work to improve the overall process. In a nutshell, if you were not vectored by the EDT for a position listed on the worksheet, you will not be selected by AFPC to fill that position (or positions). The majority of our EDT positions will be advertised on EQUAL Plus and will clearly state that you must be vectored by the EDT. In the situation where we do not have a vectored member who can move to fill a position, I am required to work with the EDT and AFPC to come up with a handful of non-vectored (and potential non-volunteers) to fill the position. As an example, we are going through this process now with filling our CDC Writer positions at Keesler. As for the CFETP/STS changes and aligning our tasks and training with Measurement Area Disciplines (MADs), I am traveling next week with MSgt Hickey (Keesler Schoolhouse Manager) to meet with AETC to start the process. If you were selected to work with the virtual Training Integrated Process Team (IPT) led by MSgt Hickey, as soon as we have a way forward from AETC/A3, we will be on a fast moving training to our U&TW…please be on the lookout for emails and we appreci-
ate any help you can provide. Mobile Training Teams (MTTs)...yes, they are coming...just have to work the
details in the U&TW.

4) **Improve lines of communication from the CFM/Team Chief all the way down to the lowest Airmen/technician.** I didn’t forget...I will still be creating a Facebook page to communicate with the field. By the
time you read the next Newsletter, it should be fully up and running and answering questions/concerns from
the field.

And finally....last but not least, my comments on the recent release of TO 00-20-14:

**“W” actions:** No longer sampled and PAMS has been changed to reflect; this likely means you will be
running a few more difficult QRs each month.

**Measurement Area Disciplines (MADs) and Risk-Based Sampling:** The whole intent of the change/wording is for each PMEL Flight Chief or Site Manager to determine how they sample their MADs (or when they choose not to sample). You know your risk more than I do, so you need to be able to develop and align your QP PR sampling strategy to meet your needs. Note: There are still PMELs doing basic calibrations for ARs/PRs to cover their MADs...that does not maximize PR coverage and is not likely to be effective. Also, if you covered your MAD and the technician who ran the item/PR no longer works at the PMEL, are you still “green” in that MAD? Just remember...length of time elapsed since the last PR in a MAD equates to higher
risk. So basically, if you haven’t looked at the MAD in a while, the longer you wait to do another PR in that
MAD, the higher the potential risk (as a reminder, 12 months is the “minimum” requirement).

**Evaluator Proficiency Evaluations (EPEs):** Two per year per QA Evaluator (matches technician AR requirement); two associated NCs created (Q01/Q02). Be wise in how you select these (what item and what technician)...something to consider in your risk-based sampling strategy.

> “Progress is impossible without change, and those who cannot change their minds, cannot change anything.”
> - George Bernard Shaw

**GREGORY D. JOHNSON, CMSgt, USAF**
Chief, Laboratory Certification Branch
PMEL Career Field Manager
News and Notes

Evaluators’ Perspective

When to Assign a Process Nonconformity to a Quality Review; the Quality Review (QR)/Process Review (PR) Process.

Recently the evaluation team fielded a question regarding the intent behind section 9.2 of TO 00-20-14 regarding when to assign a Process Nonconformity (PNC) to a QR. Section 9.2.1.1 states "A QR is a complete review of end-of-line quality. Actions resulting from NCs during QRs are generally reactive in nature and point management toward areas that require further investigation using root cause analysis. The QR may identify both Quality Nonconformities (QNCs) and PNCs". Below is the evaluation team's recommended practice on how to conduct and document this process:

A QR may identify both QNCs and PNCs. The original intent of doing this was to assist management when reviewing the technician's process in conjunction with a QR. Conducting a PR jointly with a QR is encouraged to allow PQA personnel to identify processes requiring improvement while verifying quality conformance. In short, this is a PR carried out in conjunction with a QR. There are many PMELs who do not generate a separate review number; in this scenario, any improvement opportunities outside of QNC observations would potentially trigger a PNC within the QR review number. The evaluation team has observed QR reviews with any combination of the following: QNCs only, QNCs and PNCs, and sometimes just PNCs. This option to assign both QNCs/PNCs to a QR would be perfect if all QRs were done as PRs. However, the evaluation team does not recommend doing all QRs as PRs (obviously, you have every right to do so, but does the value outweigh the cost of watching one technician do the same calibration in a short period of time or continuously validating a MAD? Something to think about…). We recommend management conduct PRs in conjunction with QRs when they determine there would be value added. One example of this would be a critical item from a MAD, which was randomly selected as QR that would allow management to collect information into the health of the measurement area. If management determines the QR would not uncover any information into the health of the laboratory, it is within their purview not to perform a PR in conjunction with the QR. The evaluation team recommends management document the QR/PR determination process in their local QM.

A recommended method is to generate a separate targeted PR review number in conjunction with the QR. A separate PR review number allows management to determine how many targeted PRs the QP is conducting, and not handcuff them into doing all QRs as PRs. The question then becomes how the local QP will navigate the QR/PR process. When QP determines a QR will be conducted as a PR, a targeted PR is generated in addition to the QR. This would mean two separate review numbers in PAMS to clearly delineate between the two reviews. Any observation noted during the review that contributed to any QNCs associated with the review would be the QNC's RCA observation gathering;

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News and Notes (continued)

Evaluators’ Perspective (continued)

"Document observations made while observing the suspect process” as stated in TO 00-20-14, paragraph 9.4.1. Any other observation unrelated to a QNC is an additional improvement opportunity that should be assigned to the targeted PR review number. Below are a few things to consider when navigating the QR/PR process:

Be careful not to assign a PNC to anything related to a QNC, i.e. assigning an L16 and an A07 for missing a TO-directed limitation. This is considered double documentation and could negatively affect the trend analysis (TA) data. Also, the QNC code should rarely be changed based on what happens during the PR. One example of this would be changing an A07a (Item is missing a TO-directed limitation/ annotation.) to an L10a (Critical step, note or caution improperly performed, not accomplished, ignored or misinterpreted.), because during the course of the PR, the technician did not adhere to a TO-directed limitation step in section 3 of the calibration procedure. Why the label was not documented correctly is part of the RCA information gathering process, but is not the original problem. The original problem is that the item was missing the TO-directed limitation (QNC). The QNC will always take precedence over the PNC because the occurrence of a condition that does not conform to specifications or other standards has occurred. If an item was selected QR (end of line inspection), from the technician's perspective it would be going back to the customer. Try to think of it as during the QR/PR process if there "is" a problem with safety, accuracy reliability or traceability it is a QNC. If the technician's process "could" lead to an issue with safety, accuracy, reliability or traceability it is a PNC.

There is one caveat to this, if the item was preselected as a targeted PR from a status that indicates the technician did not calibrate the item prior to the PR (AWM). All observations would be treated as PNCs because the item is not considered an end of line inspection (QR) and is treated solely as an improvement opportunity. An example of this is an item is preselected as an AR from the AWM shelf. The technician does not document a TO-directed limitation that is required in section 3 of the procedure. This would be treated as a PNC, L16 (Documentation improperly performed/omitted.), because the condition observed by the evaluator, highlighted potential errors that could pass on to affect the end of line product quality (QR).

We would like to reiterate that this is a recommended method of navigating the QR/PR process, and this does not mean it is the only way. Management is ultimately responsible for establishing specific policy for meeting the requirements of the QP. If management's policy is effective and provides reliable data to the TA process, then that is the ultimate intent of your PMEL’s QP.
News and Notes (continued)

Tovey Load Cells and Force Press

Load Cell Calibration issues in the PMELs

Some load cells have been over-ranged in the PMELs and we’re trying to determine the correct course of action to reduce the future number of damaged load cells. The problem is mainly with the use of the CS10-2.5K-B300 load cell. It is the smallest load cell and can easily be damaged by over-ranging the cell. Because the 2.5k load cell looks exactly like the 10k load cell, we will visually identify that the user has a 2.5k load cell loaded into the force press. The AFPSL technician has begun putting a piece of red tape on the 2.5k load cell. This will alert the user when he or she installs it into the force press to be careful and ensure the correct data is loaded for the load cell in the computer for the automated press. It will also signal the user to be careful when hand pumping the manual force press.

Zero Balance

We have received phone calls and emails concerning the zero balance of the Tovey load cells. The manufacturer’s manual was unclear and they were contacted to clear up the issue. The zero balance is not a specification, but a quick indication to ensure the load cell is still functioning properly and not over-ranged. We received one in last week and upon connecting it to the indicator the reading was 0.6xxxx, this is a good indication it was over-ranged. The zero balance reading should be within 1% of the rated output value. Meaning 1% of 4mV/V or 0.04mV/V. (Example: If Zero Balance = 0.00024, the Zero Balance check passes if the value is between -0.03976 and 0.04024)

C3-100 Set-up Tips

The set-up and spacing of the C3-100 force press is critical to producing accurate and repeatable results. The following are some basic set-up tips to help achieve quality measurements.

Ensure the press is level: An off the shelf level was initially used but was not effective. The best results were achieved using a precision level on the upper and lower crossheads (see figure next page).

Counter-Balance Alignment: Lower the upper platen (see figure next page) onto the standard load cell to lift the yoke off the collars. The platen rods should not make contact with the upper crosshead. Ensure that the power cable to the toggle switch box is not pulling the yoke. The TI’s compression ball should look aligned to the center of the ball adapter. The counter-balance arm can be rotated and the counter weight can be moved up and down the balance arm to properly align the yoke.

Collar Alignment: Misalignment of the collars is noticeable when raising or lowering the upper platen from the standard load cell. The adapter in the upper platen should be centered over the standard load cell compression ball and all movement should be in the vertical direction. If misaligned, the upper platen will translate horizontally as well as vertically. When tightening the collars, push down on the collar to ensure that it remains flat. If the collars become difficult to tighten, remove the bolts from the collars, clean, and apply a light coat of oil.

Proper Spacing: Spacing is critical to ensure that the TI doesn’t engage before the zero reading is established. This is important for both compression and tension calibrations. Once the yoke has been lifted onto the standard load cell, the software will automatically zero out the weight of the yoke. If the TI engages the load frame before the zero is taken, you will be unable to achieve quality measurements. Ensure there is enough space between the TI and the load frame for the software to have time to zero out the weight of the yoke.

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News and Notes (continued)

Tovey Load Cells and Force Press (continued)

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News and Notes (continued)

Awareness is Key When Calibrating and Using the Low Torque Calibrator, P/N 072981

The Low Torque Calibrator is an essential standard that allows PMELs to calibrate the Mountz TLS0022 torque screwdriver. This screwdriver is part of the 3829AS110 Tool Kit that is used to support the Joint Helmet Mounted Cueing System. The TLS0022 torque screwdriver in the 3829AS110 Tool Kit requires a preset torque value of 2 +/- 1 in-ozf.

As most of the technicians that work with these items know, the Low Torque Calibrator is extremely delicate as it has a low measuring range of 1 to 10 in-ozf. As a point of reference: the average male thumb and four finger can produce a torque over 212 in-ozf, which is 20 times more than the Low Torque Calibrator’s maximum range. This low range makes the Low Torque Calibrator extremely susceptible to over-ranging.

Over-ranging the Low Torque Calibrator is the most common cause of damage and is the easiest for the field to prevent. The following steps are been taken procedurally:

- To help prevent over-ranging during use, the technician will be required to exercise the Low Torque Calibrator with a calibrated torque indicating device. TOs that use the Low Torque Calibrator, e.g. 33K6-4-3014-1, have been updated.

- To help prevent over-ranging during calibration of the Low Torque Calibrator a few new Cautions are being added to the calibration TO 33K6-4-3776-1. These additions will caution technicians that when mounting the calibration wheel to the Low Torque Calibrator not to adjust the calibration wheel while mounted to the Low Torque Calibrator or when applying torque to the Low Torque Calibrator.

Corey Hyatt
Mechanical Engineering Branch/WMNM
AFMETCAL Personnel News

Evaluation Team Welcomes MSgt Jason Greer

The Evaluation Team welcomes MSgt Jason Greer. He arrived in August with his wife Jessica, his son Caelan, and daughter Eris. He brings 16 years of wide ranging experience. He worked 4 years as an F-16 Crew Chief, 2 years as an AFSO 21 Program Manager, and has 10 years of PMEL experience as a Quality Manager and TMDE Section Chief. MSgt Greer has been stationed at Nellis AFB, Travis AFB, Osan AB, and Seymour Johnson AFB. The Evaluation Team is happy to have MSgt Greer on board and looks forward to his positive contributions. We wish Jason and his family the best as they settle into the Heath community.

MSgt Gerald Johnson
Laboratory Evaluator, AFMETCAL/WNMQ

Paul Moretti Joins the Plans & Analysis Section

AFMETCAL welcomes Mr. Paul Moretti, Financial Specialist, to our Plans and Analysis Section in the Resource Management Branch.

Paul is filling the position vacated as a result of Mr. Billy Sandifer’s retirement in May.

Paul comes to us from the Defense Accounting and Finance Center in Columbus, Ohio, where he was a staff accountant and a member of the management team.

Paul will be working in all areas of Financial Management, including budget, accounting, auditing, travel and providing professional advice and assistance in the application of generally-accepted accounting principles, policies and procedures.

We are extremely happy to have Paul join our AFMETCAL team.

Gail Pellett
Plans & Analysis Section Chief
AFMETCAL Personnel News (continued)

Electronics Engineering Branch Welcomes New Employees

The Electrical Engineering Branch welcomes Marc McCaslin to AFMETCAL. Marc comes to AFMETCAL from Offutt AFB PMEL in Nebraska where he previously worked as a PMEL craftsman; while working at Offutt AFB PMEL, he earned his Bachelor of Science in Electrical Engineering from the University of Nebraska. Marc brings a wealth of knowledge and experience that will benefit the AFMETCAL program as he works as an engineer in the RF/Microwave measurement area. In addition to being an Air Force Reservist, he enjoys golfing, fishing, and working on cars; but his favorite activity is spending time with his family and friends, including his two daughters. Welcome to Ohio Marc!

The Electrical Engineering Branch also welcomes Josh Larson. Josh was raised in Dayton, OH and is a graduate of Wright State University, where he earned a Bachelor of Science degree in Electrical Engineering. He joins us after previously working as a project engineer in Dahlgren, VA. Josh will work mainly as an engineer in the RF/Microwave area, working with Vector Network Analyzers and Signal Generators; he is also working on becoming Level 1 Engineering Acquisition certified. Josh enjoys cheering on the Michigan Wolverines in his spare time (no one is perfect), and by his own admission is a frequent consumer of Taco Bell. Welcome back to Ohio Josh!

The Electrical Engineering Branch also welcomes Mrs. Kaylee Grossenbaugh. Kaylee joins EE as an Equipment Specialist after previously working in a similar capacity in the Foreign Military Sales (FMS) Branch of AFMETCAL. In addition to undergoing refresher training in the Air Force Primary Standards Lab, Kaylee will be working in the DC/LO measurement area focusing efforts on Oscilloscope/Rise Time TMDE and the automation of those calibrations. Kaylee is happily married to her husband Cory, and has two beautiful children, Delilah and Owen. In her spare time (that she doesn’t have because of those kiddos) she enjoys watching movies, and painting nails. Welcome to EE Kaylee!

Jim Bohus
Electrical Engineering Branch Chief/WNME
AFMETCAL Welcomes New Engineer to the Mechanical

Shane Popson joined the Mechanical Engineering branch last October as a recent graduate from The Ohio State University with a degree in Mechanical Engineering. Shane is currently training in force, volume and complex geometry—think three-dimensional measurements with standards such as the Articulated Arm Coordinate Measuring Machine. Shane grew up in Ohio and in his free time is a musician and avid sports fan.

Jeremy Latsko
Mechanical Engineering Branch Chief/WNMM

Technology Application Branch Welcomes New Logacistian

Technology Applications Branch welcomes Pete Stepson. Pete comes from the Electronics Engineering Branch and brings a unique set of skill sets that will serve him well in his new role. Pete is assigned as the Metrology Logician and Technical POC for the Tankers and Cargo Teams. Pete’s vast experience with in the AFMETCAL Program, AFPSL, and AF PMELs makes him an ideal member of our Tech Apps Team. He will be assisting AF Program Managers, System Engineers, and Program Analysts of major Weapon Systems, Automated Test Systems, Automated Test Equipment and Peculiar Support Equipment toward meeting their program metrology requirements. Feel free to give Pete a call and wish him well in his new position.

Bob Cleland
Technology Applications Branch Chief/WNMA
Some of the articles to look for in the next edition:

- Comments from the AFMETCAL Director
- Words of Wisdom from the Chief of the Laboratory Certification Branch
- News & Notes from AFMETCAL, the AFPSL and PMELs in the field
- Interesting articles From the Benches of PMELs throughout the world
- And much, much more!

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