EDITORIAL

Well, but "I" cannot do that!!!!

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This communiqué is an extension of my June 2015 editorial titled ***"Déjà vu . . . Well, but we can't do that because . . . A Redux."*** A redux because that was an update from 2007, of which my favorite character was a most unfortunate fellow who could not find his exit from a Mobius strip. Can you imagine?

A goal of my editorials is to bring problems, issues, and difficulties to light so that they can be corrected, or at least improved upon. My approach has been to poke fun at the stuff and use humor to make obvious the irony and absurdity of a situation. This latest missive has potential to benefit companies that may be in need of outside services as well as those who supply them. However, in this case, because of the very cause of the problem at issue, the potential for improvement is probabilistically slim, nil, nada, none. It is a rather long read, so for those who are not interested in the who, what, where, etc., you are excused to reconvene at the lessons learned (last paragraph).

The Painful Recap. To briefly recap from June, XYZ International was marketing a new "stuff-mover". Unfortunately there was no new mover to market, because engineering was having difficulty developing a viable product. Once again, a classic example of engineering being under the gun because marketing got the order of horse and cart confused. As is many times the case, development of a new product is based on success of an existing design. Seemingly such is the case in this instance; however, there is no real basis, because every dynamic parameter was changed. Everything that influences dynamic stress had been changed; the geometry, stiffness, mass, magnitude and orientation of forcing, as well as frequency and harmonic content of both driving and driven forcing functions.

My philosophical approach to shake-and-break troubleshooting is termed **IQBF** (**I**dentify and **Q**uantify **B**efore **F**ixing). As I stated in the previous editorial, it never became a household acronym, probably because you cannot pronounce it as a word. So, after much thought, I came up with **F**ind and **U**nderstand **B**efore **A**ll **R**epairs, or **Fubar**. Sounding familiar, it was noted that such acronym already exists – but in a somewhat different but yet related context. I believe this can still work by using the classical definition in caps to describe the circumstance of the basic problem and the new lower cased acronym to guide thereafter; in other words, **FUBAR/Fubar**.

So, if you hear this vigorously shouted throughout the shop, you will know that the announcer is not stuttering. Sorry for the digression. Back to reality. The concept is really simple. You have a problem, you identify the problem, you understand what it is and why it exists, then you fix it, and this next point is really important, without creating new problems. Unfortunately, XYZ miserably failed to comprehend the concept, even after being given a complimentary tutorial; thus, the editorial "*but we can't do that because.*"

How Dismal Can a New Design Really Be? Starting with the "old reliable" stuff-mover, it took XYZ far too many design iterations to seemingly meet its required acceptance test so that the unit could be certified. "Seemingly" can be so cruel when reality sets in, because things started to break and fall off during prototype testing, and stress amplitude "was found" to have doubled. All were strong indicators that certification was a moot point. To rub salt into the engineering wounds, the iteratively cobbled-up design was far too expensive to be competitive in the market place. The only project goal met was that off-shore components were cheap, to which I say it is of no surprise that cheap begets inconsistency, especially, and this is extremely hard to believe, if there is no specification other than to move stuff; there is no specification for balance, nothing for bearing vibration, no specification at all for anything that generates stress, nothing.

The Real Plan has to be Status Quo. Back to the crux of the matter. XYZ sought outside services to develop a new program that would get its failed project back on track (as if it were ever on the right track). However, after reviewing the submitted program, XYZ arrogantly took the posture of "*but we can't do that.*" Enter the editorial humor of how engineering should not let marketing gain control of the bus, and how engineering should be more methodical in exercising due diligence of product development. Not readily apparent at the time was that the actual driver of the bus was the most feared "department of bottom feeders," the legal department. I will attempt to make the explanation humorous, but humor can only go so far, which reminds me of my favorite lawyer joke: *Do you know why you never see lawyers on the beach? . . . Because cats have already covered them up!*

While the proposed outside program was rejected, XYZ nonetheless wanted to move forward in the same manner that got them this far. XYZ announced that it would remain in the lead and direct all efforts, which ironically is exactly why the project had failed so wretchedly. But whatever. History has shown that when a company seeks outside "experts," rejects the proposed path forward, and instead decides to use experts as mere technicians under their direction, project costs escalate, wheels spin, time creeps, and various fingers ultimately point in various directions for blame. For companies that have no concern for either effectiveness or efficiency, money can be thrown at any problem, but this does not necessarily guarantee nor lead to success.

The Three Dimensional Dynamic Challenge. Now, here is the stuff-mover technical challenge. The driving forcing function is harmonically rich, of which the first five peaks are of known concern when in close proximity to a respective structural natural frequency. The driven forcing function is similarly rich and potentially problematic for the same reason.

Next, there are two running speeds, meaning that there are now 20 discrete frequencies that could be in close proximity to various natural frequencies. To further complicate the matter, the speed slightly lowers as the load increases, resulting in the highest harmonic sweeping lower by a frequency value of five times the speed change.

Not that further complication is not possible, the structure stress stiffens as the load increases, resulting in an upward shift of some natural frequencies. For all interested readers that say "no problem," here is the next dynamic curve ball – boundary conditions. The unit can be bolted to a rigid foundation, and get ready for diametrical opposition, or mounted on vibration isolators. Is there anyone in the industry who thinks that natural frequencies and mode shapes will remain the same between such "fixed" and "free" boundary conditions? Mode shapes will shift, interchange, and become completely different, resulting in different stress values even if at the same forcing frequency. A unit that is "tuned" to pass the test while having one boundary condition will more than likely fail on the other. So, that is the three dimensional dynamic design box, or you may prefer to visualize a rolling donut that must be skewered.

Additionally, it is not uncommon that compound issues contribute to a problem due to multiple harmonics being in close proximity to multiple natural frequencies. It is an extremely challenging task to deal with multiple forcing functions, multiple operating points, multiple natural frequencies, and multiple boundary conditions, but achievable. Sometimes fixes involve weakening certain structural areas while simultaneously stiffening others. But one thing that is needed for success is consistency. Consistency of structure and consistency of forcing function. A stuff-mover without specification will never be consistent. In other words, you can develop a single unit and be successful, but the next unit will act like a brother from another mother.

The Path Forward Really Does Need a Compass. So, in what direction does XYZ want to move forward? Answer: Do not establish a baseline; that is, do not test "old reliable" to find out why it works. Start with "new unreliable," make it pass the acceptance test with it bolted to a rigid foundation while reducing its manufacturing cost. End of project.

Pointing out to XYZ the pesky fact that a greater number of units will be mounted on vibration isolators than are bolted to a foundation did not seem to enlighten the fact that you can only certify a unit for its tested condition. XYZ responded that "we have done it before!" Wow! Excuse me – you have got to be kidding! You have done this before? You have certified a product for one condition and then sold it for use in another? Gee wiz. Before outside services begin to work for XYZ, one must ask if its malpractice insurance is paid up? (Hold this thought, because it is covered in the terms and conditions.) Malpractice aside, one should really worry about criminal implications should human life be lost when a stuff-mover catastrophically disassembles.

From an outside services point of view, such engineering shenanigans are totally unacceptable, especially when human life is involved. As a result, the business self-preservation gene automatically kicks in, and engineering reports will have to be precisely worded with defendable findings and recommendations. Unfortunately, such journalistic approach ultimately promotes finger pointing and bullying, because the report cannot state what the company ultimately desires, nor should it, because the dictated path is not one that leads to comprehensive success.

So, it can be said that finely crafted reporting with precise findings and recommendations can be done out of necessity and professional survival, but one must ask if this project should be of any further interest? On the plus side, other stuff-mover projects have been technically challenging and professionally rewarding. But should the quest for technical reward and satisfaction trump all the red-flag warnings of a looming bureaucratic excrement storm on the horizon? The correct answer is this is a good time to walk, or in this case, run!

Terms and Conditions by Reference – a Novel Approach. XYZ wanted to proceed, so it issued a "statement of work." This document informs that services are subject to the terms and conditions of purchase, "*herein incorporated by reference.*" Even though incorporated by reference, the supplier "*must acknowledge receipt, review, and acceptance of the XYZ terms, and commencement of any work shall constitute automatic acceptance.*" Strange wording! I suppose it is gratifying to know that XYZ will mail a hard copy of the contract terms on written request!

Whereas the title "*statement of work*" seems obvious, the document also wants the supplier to further identify what items are outside the statement of work. I hate to be equally obvious, but isn't that the stuff not in the statement? Whatever! The next surprise is in regard to travel. Given that the stuff-mover resides several states away and project duration is unknown, it is disheartening to see that XYZ will not reimburse travel time, expense, lodging, or subsistence. For every problem, there is generally a work-around. In this case, if you do not want to pay for a visit to the mountain, please send the mountain to me.

Ok, this does not look good, but I feel compelled to make a formal request for a copy of what no doubt will be a dastardly T&C document, but one should give benefit of doubt until proved otherwise. Document received, and it is indeed a draconian document. I have reviewed many, many such documents, and it is my opinion that God invented red pens for such reviews. This document is so bad, is so vile, is so contemptible that I did not have an adequate supply of pens. On the flip side, this document is the most finely crafted manuscript I have ever reviewed. Page after page takes every potential issue and gives the advantage to XYZ while painting the supplier into a three-dimensional corner from which there is no legal escape.

So, When Did You Say I will Get Paid? The first thing I think about when someone says "terms and conditions" is "payment." Look at it this way: a company has a problem that is causing them corporate angst, and they are seeking relief in the form of instant gratification. This supplier's terms for providing instant gratification is "net due upon receipt." You are hungry and in need of nourishment. You go to the fast food joint across the street. You give them money. They give you food. Simple. In this case, I even offer to give them the food before they pay, just like fine dining. Now, even though the terms are net due, the reality is more likely 30 days, and that is if you are dealing with a nice company that is appreciative of beneficial results. It is not uncommon to see most companies at 45 to 60 days. XYZ . . . 90 days, with bureaucratic means to reset the clock to start counting down another 90. To which I ask the CEO and chief counsel if they are paid while traveling, and how many days it takes before their expense report is reimbursed?

Let's Go with the Yet to be Determined Cheaper Services. Let us talk about "competitiveness." I have never seen a clause like XYZ's. Usually such clauses state that the supplier shall not work for any competing company for some specified period of time, even if it is for a noncompeting division of a competing company. But the XYZ clause further states that even after the supplier has received a contract and has started work on the stuff-mover project, if XYZ seeks and receives a quote for a lesser amount, even if from one of their own divisions, the supplier has five days to honor the competitor's quote or the buyer will hire the competitor.

Interesting twist on job security! Even from one of its own divisions? Really? How does that cost basis compare, and if that is the case, should XYZ have not talked to its own division first? Who is to say that you can continue a job just because you are doing a good job in a successful manner? And cheap services? You generally get what you pay for. XYZ's response to questioning this clause was to state that exercise of that clause was not its intent. To which it was requested that it be removed as unnecessary. To which XYZ responded "*but we can't do that.*"

Hey, Don't Worry, I Got Your Back! Or is it I'm Getting it in the Back? Let us talk about warranties! Remember that XYZ is dictating the scope of work? Well, the T&C states that it is the supplier's responsibility to determine what XYZ really needs, but then contradictorily states that work must be in compliance with XYZ's instructions. And what happens when those instructions are contrary to the supplier's recommendations? What happens when the new stuff-mover goes south? Well, simply put, according to the T&Cs, it becomes the supplier's problem!

Remember my joke about its malpractice insurance? Well, XYZ requires its suppliers to be, what I would consider, vastly over insured, which begs the question as to why. The answer becomes quite obvious in the T&Cs. When the stuff-mover product goes south due to XYZ's dictation, it will become the supplier's problem. Not only will the supplier defend XYZ against third-party actions, but most disturbingly, and I find this hard to believe, the supplier will finance XYZ's product recall! What a hoot! Probably even a hoot and a half!

I questioned the corporate lawyer as to his background. He said he had come to XYZ from private practice. I asked him if he would advise one of his private clients to sign such a contract. The answer was without hesitation a shocking "no." Then let's redline some of these clauses! To which he responded "*we can't do that, it is not negotiable.*" Then why should I sign such a draconian document? If you want the business, then sign it, if you don't, then don't. If there is court action or a recall, the courts will sort out your culpability. It was suggested that XYZ develop a professional services agreement rather than one apparently focused on third-world vendors of fraudulent nuts and bolts. To which I was informed that this agreement is indeed for professional services! This is the point where I now have an obligation to say "*well, but I can't do that*!"

Lessons That Should be Learned but May Have Been Missed. We have those who need services, and those who supply them. In this case, the one who is in need has major problems, problems that were brought on by their own incompetent corporate actions. Actions that were clouded by a need for expediency transported by marketing's forever confusion between the horse and the cart, which I might add is crystal clear and not debatable compared to chicken and egg.

Quite frankly, marketing knowingly sold a product that did not exist and should take

the corporate heat, but engineering chose to acquiesce, cut corners, take chances to provide such a product within a ridiculously desired window of time, and did so by using components that were purchased on the cheap without proper specification and assembled without same. Bottom line, the product did not meet requirements, was unreliable, was unsafe, and was embarrassingly too costly to manufacture despite using the cheapest components.

Upper management directed that outside services be used to remedy the design. However, engineering was unwilling to accept outside recommendations, wanted to continue dictating its failed program, was continually willing to cut corners, and most disturbingly, was willing to have the product falsely certified to conditions that the majority of product would never see. As a result, the majority of units would see operating conditions that would most probably culminate in widespread product failure.

Enter the purchasing department that will not pay the entirety of expense needed to solve the problem, then not pay in a timely manner, and a legal department that has to CYA the entire corporate body of incompetents,

In fact CYA is entirely the wrong term. Properly, the legal department devised a plan through its T&Cs that falsely shifts all technical blame and financial burden away from those responsible to now be resident with the suppliers. And the absolute absurdity of the plan is that they require the suppliers to agree to, and acknowledge that, it is OK for them to be screwed for the privilege of working for XYZ. After all, we are XYZ!

And now you know why you never see lawyers on the beach! Lesson to be learned for those in need; take responsibility for your own actions, do not look for a scape goat, and do not act stupidly with a high degree of arrogance. For those who supply services: do your due diligence, read "all" the paperwork, including those incorporated "*by reference,*" ask for revisions where needed, do not be afraid to walk away, and please do not forget to turn over every rock to see what kind of slime may be lurking beneath. Thank you for reading and have a great day! SV

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