

Risk Analysis for A&P Mechanics

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Risk analysis for A&P mechanics? Really? What are we going to discuss now, 401k investments for the financially impaired? Not today, but we are on the right thought process. Risk analysis and risk management are terms more thought of in the same vein as mortgage brokers, investment bankers and financial advisors. If nothing else, the word management is there, so shouldn't this be something for our boss to worry about and not us? Yes, the boss should worry about it and his boss and right on up the chain of command. But why shouldn't we, the worker bees worry about risk also? After all, if something goes wrong, who has their name on the work that was done?

If we think about it, we are at risk every day in almost all that we do, from driving to and from work, to eating out. What are the chances of being involved in a fender bender? How about eating out and getting food poisoning? How about just being around other people and catching a cold or worse? We are so accustomed to certain risks that we pretty much put them out of our minds and don't think of them as risks. They are just part of our lives.

When I was a member of HAI's Technical Committee, I had the privilege of attending meetings with a terrific group of helicopter maintenance professionals who bring a tremendous amount of expertise and experience to the table. One of these individuals is Don Lambert, who at the time was the Senior Director of Technical Integrity with Air Methods Corp. At one particular meeting, Don brought in a worksheet on Risk Assessment for Technicians that got me thinking (yes, I know that can be dangerous.) If we could apply a certain level of risk analysis to the work we do every day on the helicopters/components entrusted to our care, how much better and safer could we do our jobs, and in turn, improve the helicopters safety in flight?

To begin, we need to define just what risk analysis is? According to ISO 31000, risk analysis is the identification, assessment and prioritization of risks (defined as *the effect of uncertainty on objectives*, whether positive or negative), followed by a coordinated and economical application of resources to minimize, monitor and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities. Wow! That's a mouthful. In simple terms, we could say that in our profession there are risks that we encounter all the time, but we are so used to them, that again, we do not think of them in terms of risk. The key words above are; to minimize, monitor, and control the probability and/or impact of unfortunate events. In our line of work, unfortunate events tend to lead to time, cost and safety issues, and those are events that we definitely want to minimize and/or avoid.

When performing risk analysis with respect to performing maintenance on an aircraft, engine, gearbox, etc., the risk involved could be so minor as to be transparent or seen as no risk at all. The risk could also be seen as being so major that the work should be declined. How do we know what level of risk we could encounter before it happens? The chart that Don showed me helps us to do just that, evaluate the risk for the job to be done before the job starts or is even accepted! The chart breaks down the risk analysis into two parts. Part one is a "General Risk"

section, and part two is a "Work Scope Risk" section. The form's header has space for the mechanic's name, A&P number, aircraft, base location, date, time and shift.

The General Risk section concerns itself with questions that are applicable to the mechanic and the work environment. The Work Scope section concerns itself with questions that are applicable to safety of flight and the shift involved. Now in all fairness, some of the questions shown on the form are ridiculous, but the form at that time was not finished and some questions are there just as fillers. They should not in any way be thought of as legitimate questions or feel that any operator would actually think in these terms.

A series of questions is asked in each part and assigned a numerical value. After filling out both sections of the form, the point values assigned are totaled. There is a space to fill in a number for that question, so in fact what the mechanic filling out the form would be doing is assigning a "risk" value to the question being asked. The lower the number filled in, the lower the risk on that question. There are four subtotals that are added together that give the risk assessment for that particular task. The subtotals are categorized as Crew Subtotal, Aircraft Subtotal, Flight Request Subtotal and Shift Change Subtotal. The overall risk is categorized as:

Low risk is a point value less than 30

Medium risk is a point value between 30 and 49

High risk is a point value between 50 and 64 points

Extremely high risk is a point value greater than 64 points

A sample of each section of the chart is shown below.

Mechanic's Name	A & P number	Aircraft
[Redacted]	[Redacted]	[Redacted]
GENERAL RISK		<i>value</i>

Mechanic

- 1) Mechanic has less than one year exp on this aircraft 5
- 2) Mechanic has less than one year at this base or shop 5
- 3) Mechanic has less than 10 years as an A & P 4
- 4) Mechanic does not have factory school on this model airframe 5
- 5) Mechanic has not performed this task before 10
- 6) Mechanic has not performed this task within 30 days 5
- 7) This is not my primary aircraft 5
- 8) I do not have work stands or aids to help with this task 5
- 9) I do not have a mechanic to review my work 5
- 10) Mechanic does not have factory engine school for this engine 5
- 11) I contacted another person for help with this task 5
- 12) I do not have an inventory of all of my tools 5
- 13) I am missing some my personal tools 50
- 14) I do not have the technical manual for this task 50

Crew Subtotal:

ENVIROMENT

- 1) I have worked over 12 hours in the last 24 hours 5
- 2) work is being performed outside 5
- 3) Lighting is poor 5
- 4) Work place temp is below 45F or over 90F F 5
- 5) Complete tooling i is not on hand 5
- 6) I am under pressure to return the aircraft to service 25
- 7) My base is out of service and everyone is calling me 25
- 8) I was called back to work from home 5
- 9) I was awoken from sleep to return to work 5
- 10) I am distracted by personal issues 5
- 11) I have been working on more than one aircraft today 5
- 12) I have been interrupted before completing this task 5

Aircraft Subtotal:

Revised 15-Aug-12 Mechanic's signature _____

LOW(<30)/MED(30-49) = Mitigate as Necessary HIGH(>50) = Mitigate to Low/

Base	Date	Time	Shift AM/PM/Other		value	
WORK SCOPE RISK						
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	25		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	10		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	25		
			<input type="checkbox"/>	1		
			<input type="checkbox"/>	75		
			<input type="checkbox"/>	75		
			<input type="checkbox"/>	50		
			<input type="checkbox"/>	25		
			<input type="checkbox"/>	100		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	100		
			<input type="checkbox"/>	125		
			<input type="checkbox"/>	5		
			<input type="checkbox"/>	10		
			<input type="checkbox"/>	10		
			<input type="checkbox"/>	1		
			<input type="checkbox"/>	-1		
			Flight Request Subtotal:			<input type="text"/>
			SHIFT CHANGE Subtotal:			<input type="text"/>
			Risk Assessment Total:			<input type="text"/> = <input type="text"/>
Med EX HIGH (>64) = Mitigate to Low/Med or Decline						

The point values totaled for a given task are an indication that there is low risk and that indicates you do the task. Medium risk tells the mechanic he needs to take appropriate action to reduce the risk to low risk before continuing. High and extremely high risk indicates that action needs to be taken to reduce the risk to low/medium levels. That may also indicate that a different mechanic with a different set of skills performs the task or that the task is not done at that facility at all!

The beauty of the form is that it can be customized for any type of operation. There are some tasks that are the same regardless of where or who operates the aircraft or what its mission is. There are other tasks that may be mission important for an EMS operator and others that are applicable to an MRO performing an engine overhaul. In either case, risk is always a factor and this is another tool that can be utilized to lower risk on the job.

Hopefully this article and the form may be of use to you to help lower the “risk” factor in your everyday job.