



PDHonline Course P130 (2 PDH)

Risk Assessment / Management

Instructor: Wayne Ashenfelter, PE

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PDH Online | PDH Center

5272 Meadow Estates Drive
Fairfax, VA 22030-6658
Phone & Fax: 703-988-0088
www.PDHonline.org
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Course Content

A. INTRODUCTION:

I can still remember sitting in the 3rd floor conference room at The Boeing Company, Wichita, reviewing the schedules of a program for which I was the Chief Engineer. We were developing a simulator for a program technology assessment at Boeing and the schedule and technology developments associated with the simulator were in trouble. The technology development was a part of the contract, and the simulator was also a deliverable item. Sitting in that conference room I thought “the sky is falling; it can’t be done; this is a disaster; what can we do; there is no hope.”

Have you ever been there? Is this part of your life story? How are you going to face this in the future? This is a somewhat typical reaction to a situation that appears to be out of control. It seemed to me, at that point, that there had been a comfortable schedule, things seemed to be going well, and no major problems had erupted.

Our reaction to the situation is relative to our role and responsibility in the project that we are working on. The roles that I am referring to are as follows: 1. Project leader, 2. Subordinate leader, 3. Functional organizations, 4. Implementers.

You must:

- Identify the risks
- Determine the impacts of risk
- Develop a plan to deal with risk

Risk assessment is akin to the problem that a child who is learning to spell faces: “How can I look it up in the dictionary if I can’t spell it?”. The analogies to risk assessment are: “How can I identify it if I don’t know for sure that it’s at risk. Better yet, how can I develop a plan to fix it because it hasn’t happened yet?”. We all have a tendency to procrastinate because of our insecurity in decision making. Stop worrying about the perfection of your plan. Stop worrying about the perfection of the plan implementation. Just plan it! The implementation will always be different when and if you have the problem arise. One thing that we can always do is keep a good record of the project. Then use those records as a preparation for recovery. What things in your project can be done to ensure that the project can be returned to the previous position just before the occurrence of a “disaster”?

The effect of change is disconcerting. Change itself causes us to be uncomfortable with the situation confronting us. The problem in our lives is that a lack of change prevents us from being all that we can be. The changes are never comfortable, but to grow and improve, change must take place.

You can always have three approaches; the first and second approaches do not yield the best results.

- Chicken Little Approach: The sky is falling: this is how most of us feel when we see a project or situation coming unglued. We waste a lot of energy wringing our hands while confusing everyone around us.
- The Ostrich Approach: Stick your head in the sand and hope that things will improve if you do nothing.
- Risk Management Plan: The preferred solution--PLAN AHEAD.

One thing is typically true: risks do not go away without the intervention of something or someone. Preparation for recovery becomes a significant action in a project that minimizes the prospects for loss or damage in the event of a disaster.

B. HOW TO IDENTIFY RISK:

As your experience increases, there are scars that you can draw from to identify risk situations because you have been there. Those scars are from hard lessons that have been learned from making mistakes--Mistakes that you have determined you do not ever want to repeat. What do you do until you have earned the battle stripes? These are the battle stripes, those worrisome scars, telling your friends and neighbors that you are a veteran with the marks of the mistakes that were made on prior projects.

What is risk?

The American Heritage Dictionary defines risk as a factor, thing, element, or course involving uncertain danger.

Risk is the possibility of suffering harm or loss. Risk has the potential of harm or loss during the entire life cycle development of a project. This includes all areas of the project. Risk must be evaluated throughout the project. I can remember a time we were painting a tail on an aircraft in a hanger; that same night as the paint was curing a bird made a mess on the curing paint. Would you have expected it? You might not have anticipated the bird; however, the risk of paint problems have always existed. Risk always rears its ugly head!

What are factors of risk revealed? Factors of risk are revealed in several ways:

- A missing item in the schedule.
- A technical problem not found until later in the project.
- Things take longer than planned.
- A supplier does not deliver.
- A mistake is made in the production of an item.
- A quality escapement that gets to the customer.
- A key person gets sick.

Money is insufficient.
The customer withholds funds.
A safety issue not seen.
Bad things happen.

Where does risk begin?

Risk begins at the initiation of the estimate or bids through the delivery of all of the products of the contract. We're not done until the paperwork is finished, delivered and accepted. Risk can even include receiving the final payment satisfying the contract. We like to get paid for our efforts. If the customers are not satisfied, they are not about to pay us. Risk may also include the warranty associated with the design or delivery of the final product.

C. ELEMENTS OF RISK:

The standard elements of risk deal with the Statement Of Work (SOW) which contains schedule, technical, financial, quality, and the *UNKNOWN RISK*. The SOW defines the task completion required for the funds supplied in accordance with the contract. Please note that the contract can also contain SOW requirements, so be aware of the reality of more to do in the contract. The more "loosely stated" the SOW (we described those SOW's so full of holes you could drive a truck through), the more difficult they are to satisfy. Avoid generic terms that are all encompassing and usually meaningless. You have the responsibility to make sure the contract and SOW is clear and unambiguous. Understand your statement of work to the point that you and your customer have agreement. Be sure the work to be performed is schedulable. If you have a new relationship with the customer (a new customer), that fact by itself provides a significant risk. You must establish a plan to improve your knowledge of one another. Don't leave it to the Ostrich Approach; it will kill you. In every facet of the contract you must think of how to communicate with the other members of your team and your customer. It's called your communication plan, and without a communication plan you are at risk of having a dissatisfied customer and unhappy team members. The communication plan will ensure that the customer along with other project personnel and suppliers are kept up to date on the progress of events of the project. The communication plan includes identifying events that affect the customer or those involved in the project. The plan then allows the persons involved on the project to be advised should some disastrous activity occur. The communications plan will also help efficiency of the project by making sure all those needing information will have it at their disposal.

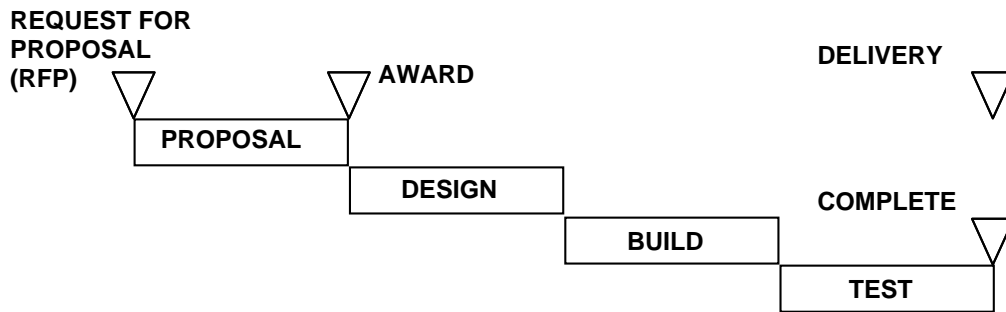
In this world today, we find a new set of ethics. It is unethical for the author to attempt to wordsmith the SOW or put spin on the SOW. The intent of putting spin on the words allows the authors freedom to manipulate the results and deliverables during the contract. Integrity tells us we must clearly state what we will do for the funds supplied and then commit to it even if we have erred in our estimate. Over the years, I have observed the tendency to find a way around the commitments to provide a cost advantage to one or the other parties. There is a clear message. It is crucial that before the agreement is made,

all parties understand and agree to the statement of work and contract. It is definitely worth the effort to provide the clarity up front rather than to deal with a dissatisfied customer and the litigation that can follow.

1. SCHEDULE RISK:

If it's not scheduled, it won't be done. "Make your plan and manage to your plan." What do you schedule? Schedule all dates, all line items of the contract and SOW, personnel assignments, tools, material, technology, suppliers, subcontractors, customer and regulatory body reviews. The schedule risk is decreased if you have adequate detail, maintain schedule reserve, maintain ease of rescheduling priorities and ease of accelerating schedule capability. Nothing is sacred; nothing is etched in concrete that cannot be changed without forethought in enhancing the success of the project. We sometimes get into the "position" of supporting a "dumb" position just because it was taken at some point in time.

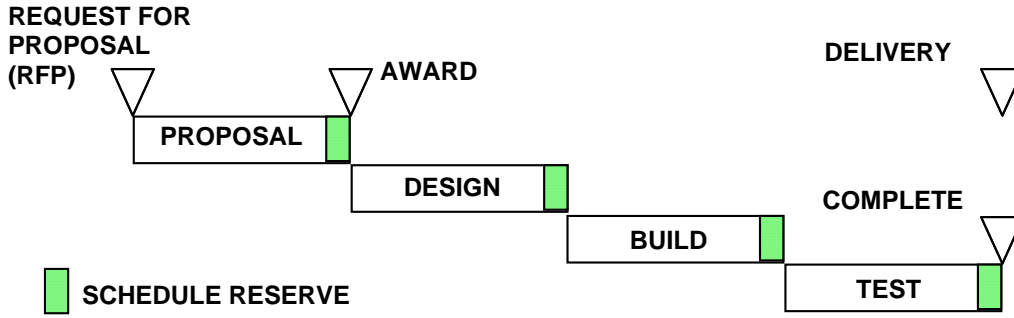
Initially, the first step in risk abatement is to adequately schedule the project as in Figure 1.



TYPICAL PROJECT SCHEDULE

FIGURE 1

It remains important that all the players, organizations, functions, suppliers and the customer buy into the schedule. The typical dilemma is that the customer usually desires to have a delivery sooner than it can be comfortably scheduled. The best risk abatement approach in abating schedule risk is maintaining schedule. A wise risk abatement approach allows some schedule reserve in each stage of the project, as in Figure 2.

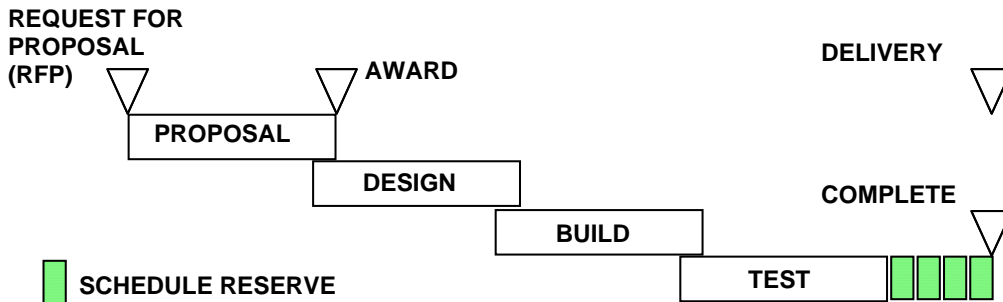


PROJECT SCHEDULE WITH RESERVE

FIGURE 2

This allows for schedule flexibility and increases schedule performance while making trades on product cost, quality and risk. Schedule reserve is an essential part of our plan and is used to maintain our schedule, cost and quality performance. The reserve in the schedule is obtained by reviewing the tasks to identify specific changes that can be made to reduce the time required in the task. For example, the task could be subcontracted to another organization. On occasion, it is possible to find a task that is really not required and can be deleted. Care must be given to ensure deleted tasks do not compromise the quality of the final product.

Sometimes additional schedule reserve can be achieved in allowing for the overlapping of project elements as in Figure 3. Some tasks can be performed concurrently even though



PROJECT SCHEDULE OVERLAP WITH RESERVE

FIGURE 3

traditionally they have been performed sequentially. Achieving schedule reserve is not difficult if you have concrete objectives and identifiable tasks that may be properly scheduled and not just a wish list of things to do. Scheduled tasks may be reduced in duration only if there is a definable action that will reduce the time required in performance of the task. Make it real; don't try to live in a dream world and hope it will happen. Schedule recovery is a subset of schedule planning and can affect cost and technical quality of the final product.

Think out of the box--always easy to say but very hard to do. I had a supervisor who claimed to have the ability to see what was not in the picture. That is to say, he could see events that others were not able to see or project.

For example, look at the box in Figure 4. to see if you can draw two intersecting lines connecting the dots without lifting the pencil.

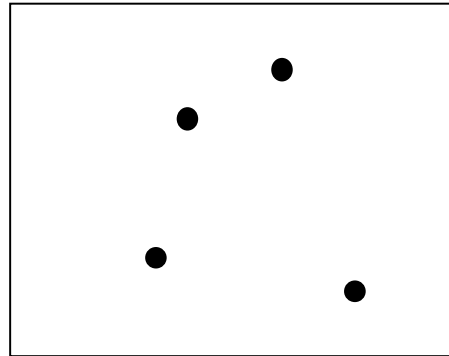


FIGURE 4

Our first attempt is to look inside of the box and we conclude that it is not possible to draw two straight lines that connect the dots without lifting the pencil. However, when we remove the constraints of the box we find that there is another way to connect the dots inside the box. You might have noticed that by my pointing to the box it directed your attention to it. This is the same problem we run into in labeling. Once you place a label on a problem statement or a person, it is very difficult to look outside of that label. Hint! Hint!

You are probably not stumped, but in order to achieve the objective, you definitely have to think out of the box as in Figure 5.

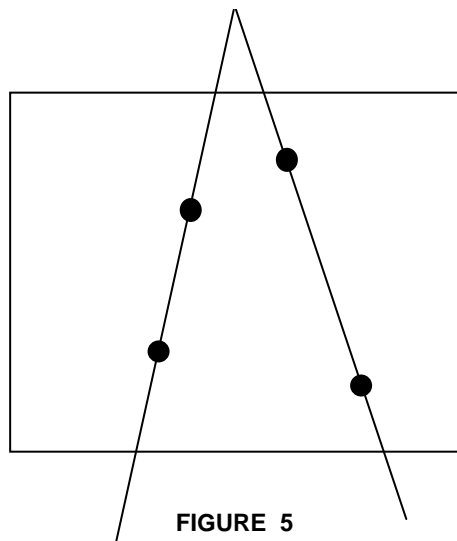


FIGURE 5

Horror of horrors, more “opportunities” that we experience in the execution of the project:

These “opportunities” manifest themselves in many ways:

- First, the Request For Proposal (RFP) is late, but the end date does not slide!
- Second, the contract award date is late, but the end date does not slide!
- Slides occur during the program execution
 - Technical problems are experienced
 - Something goes wrong in material availability
 - Wind, water, fire, or other hazards in environmental issues stop progress
 - The customer accelerates the delivery date

All of these “opportunities” reveal the need for attaining schedule reserve to enhance our success of the project. Schedule reserve is obtained by thinking smart and accelerating scheduled activities that can be done early without significantly affecting the cost, quality and schedule. Schedule reserve is not just shortening the time allowed to perform the tasks. You must have an identifiable set of plans that will reduce the time required to perform the task. I have seen too many programs that get into trouble because they just “shorten the time” allowed for the task without having a plan to achieve it. I will never forget the supervisor that had us working three shifts “around the clock” trying to recover a schedule slide. In his zeal to achieve the objectives, he suggested, during a program review, that one solution to the problem was to start working nights. You must have a concrete plan.

2. TECHNICAL RISK:

Technical risk is reduced when there are no new technologies involved, the personnel are well experienced, all tools have been proven, and the staff has worked together for a long time. Unfortunately, in all my years of service, I have never experienced that utopia of events. We always addressed the phenomenon as “breaking new ground.” Usually, we find ourselves in need of one or more of these areas: tools, experienced staff or well proven technology. Technical risk is increased when you are developing new technology or using new tools that have not been proven. Inexperience in using the tools can also affect the risk of a project. The use of untrained personnel is a plan for disaster. As part of your project schedule, it is essential to identify a training and tool-proofing plan for tools and personnel in need.

New technology is the most difficult risk to protect yourself against. If it has never been accomplished before, the risk is high because the outcome may be indeterminate. However, there are things that will reduce the risk associated with technology development. The very first thing that one needs to do deals with the concept of prototyping or simulation is to build a test unit to allow for evaluation of the item under development. It may not have all the bells and whistles that the final product has or look

very pretty. The prototype allows you to evaluate the concept with a minimal number of variables confusing the results of testing.

I must also rapidly state that it has been my experience that neither the customer nor the business managers want to spend the money to accomplish prototyping. They are also the first to criticize you for not having done it when the project gets into trouble. Many of the projects that I have observed get into difficulty by bypassing a certain amount of prototyping efforts. They come to the testing of the product and find they have missed the mark. Another risk reduction is to develop software simulators or mock-ups. A mock-up may just be a cardboard cut out that is dimensionally the same as the item under development. There are costs associated with each of these but usually at a lower price than a “full fledged” working prototype.

Obtaining technical consultants as advisors during the project can abate technical risk. They may only be reviewers of the work in process that can alter your risk significantly. Consultants will see areas that need to be addressed that will be missed by you and your staff. I have also observed non-technical reviewers assist greatly in the process of reducing risk because they look at the project with a new perspective.

3. FINANCIAL RISK

Financial risk is usually associated with two factors. The original estimates for the statement of work is one factor. The other factor deals with proper allocation of the budget you have. This includes the reserve that is held for paying for “unknowns.” Did the budget get parsed out properly to each user so they may achieve the objective? Has everyone bought into the budget that was established at the beginning of the project? Probably, there will be someone who feels that the funding was inadequate to perform the tasks they have. Have you addressed it or just told them to suck it up? The true risk reduction technique is to hold some funds in reserve. An option is to work for cost savings during the contract placing those savings in reserve. The second approach takes longer and more effort is required. It is sometimes viewed as losing by the person or organization that gives up the financial reserve.

The next step in financial risk reduction is to develop a scheduled spending profile against the budgets that were allocated. The periodic review of planned expenditures provides visibility of any budgeted effort. The detail of the spending profile is determined by the size of the project and number of people involved. Proceeding without knowing how the funds are being expended is likened unto a person driving their car in a desert without a fuel gauge. You never know when disaster will strike.

Warranty is a special financial risk that can only be covered by assessing a fixed amount of budget to design or product failure. This is included in your bid submittal that always affects the competitive nature of your bid. If you have some historical data that identifies past warranty costs, it can help. Design warranty comes from that fact that you may have a latent defect in the design that did not appear during testing, acceptance or

initial use of the final product. This failure is directly related to quality failures in design and production.

4. QUALITY RISK

Quality issues are at the top of the risk problem areas. The quality of the product is paramount to the customer. Poor quality also eats away at your profits and energy. The cost of poor quality, during any part of the project, is very expensive. You can experience a quality failure in all of the steps of a project. As the project matures, the cost of repairing a quality failure increases. The customer dissatisfaction is also increasing. It is easy to not manage the quality of the project. All the players are focused on completing the project to the best of their ability. Unfortunately that's not good enough. It is necessary that in a project the quality assurance program be thought through. Many times the quality plan is just a warmed over version to "get by" without thought to the real cost of poor quality management. We are always too busy to do it right the first time. Doing it right does not imply taking an infinite amount of time to complete an action.

The concept of inspecting in quality is flawed. Quality inspection only catches the quality defect after it has already happened. It is very expensive to fix second efforts. Although you can prevent escapements, that is, quality defects that make it to the customer, the task is daunting and very expensive. Do it right the first time and the cost of second effort goes away! What this means to the project leader is that you cannot take quality for granted. Quality must be designed into the project. If you take time to do it, you will decrease the cost of the project and put more profit in your business.

Let's just think out loud for a minute. What have we done to put in place a plan insuring the quality of our project? Quality is directly related to the experience, tools, and training of those involved in the project. Do all the players understand the program and who they need to communicate with to be successful? Have we scheduled sufficient points in the project to review where it is going and the changes being made? Is there a plan for maintaining tools and equipment? Quality does not just happen just because people do good work; it is a result of careful planning. It is a result of conscious planning and conscious cost trades of activity versus no activity. Don't assume that if we just exist quality implementation will follow.

5. UNKNOWN RISK

There are unknown things that happen that we would never imagine in our wildest dreams. How can I know or deal with a situation that has never happened? Take for example the 9/11 tragedy; no one would have predicted the horrible results, and even the perpetrators did not know they would destroy the Twin Towers. No one plans to have a fire in their home, but most homeowners keep fire extinguishers and smoke detectors in order to protect their homes. Usually, not too far from your home is a team of people that

are EMS and fire fighter teams to aid in medical and fire emergencies. Remember the bird in the hanger that spoiled the paint job? What one of us that has painted anything hasn't experienced a bug or dirt defect in the freshly covered paint job? Far fetched? The obvious point being made is, you still may prepare for the unknown even though it has never happened in the past. There is much gain in the multitude of counselors. Have others look over your shoulder to evaluate the plans you have made. Identify the problems, build a plan, execute the plan, evaluate the plan, and if the plan doesn't work, do it again.

The most important part of dealing with the unknown is preparation for events that place you in the position to recover from a disaster. For example, if you are involved in computing activities, it is important to make sure that the product is backed up. Furthermore, it is important to schedule those back-ups to provide the capability to recover data in a reasonable time frame. You would not wait until the project is completed to back-up your data. Periodic storage of a back-up copy at a second site provides for additional insurance from a loss of data.

The “knee jerk” reaction:

I would be remiss if we didn't discuss the issue of knee jerk reaction relative to risk. Another consideration to risk abatement is commonly known as the knee jerk reaction. This situation occurs when someone attempts to make an instantaneous change to an activity without any plan. No matter what their intent is, the implementation of a change to any activity without forethought usually leads to multiple repairs needed in the project. It can cause long-term hard feelings and infighting in the players of the project. This is a maneuver by some that are afraid to confront others in decision making. It also comes from a person unwilling to plan and look at the details of a project. In either case, it misses the communication plan that tells the players on a project what is going to happen and when. It is also important that everyone understands why a decision was made even if it appears to take more time in the project. How can anyone join in the project if they are ignorant of the intent of the actions taken? How can we receive gain from their expertise and background if they are treated as mushrooms? People do not grow well in the dark.

Knee jerk reaction causes / symptoms are:

- Frustration
- Confusion
- Anger
- Miss-direction
- Cost
- Inefficiency
- Duplication of efforts
- Dissatisfaction

PLAN – PLAN - PLAN

E. AUDITS:

Audits are essential in performing the assessment of the effectiveness of risk assessment efforts. Have we left holes in our plan? Have we done enough? Are there things that we thought were insignificant and we ignored them? My first impression of an independent audit performed on my work that it was a waste of time. No one could understand the project as well as I. I already knew what was wrong and was working hard to fix it. What arrogance, what pride, no one is aware of all the problems and pitfalls that are now or in the future. Audits should be embraced and held in high esteem. We might have a blind spot that some one looking over our shoulder would point out. A blind spot is just that: you can't see it because it is in your blind spot.

For example, some time ago, we experienced severe weather causing power outage at our home for about two weeks. It didn't take long for me to buy a gasoline-powered generator to provide the missing power. I set up the generator and proceeded to run extension cords to the lights and appliances. I felt very good about the results. I had power again, the freezer and refrigerator were running, and it was very hot and fans were greatly appreciated. I felt very proud of my accomplishments. While showing off my good work to our neighbor, he promptly asked me why I had run all the extensions over the house. He proceeded to tell me that all I needed to do was turn off the main circuit breaker from the power line, plug the generator into the house wiring and use everything as normal. Silly, yes, but I had a blind spot. I could not see the forest because of the trees.

A good audit needs to have preparation just as we prepared for the task under contract. Make sure your auditors have easy access to all the elements of your work. Do not attempt to mask anything; full transparency is required.

Another form of audit is an after-action report that allows all the players in a project to review those things that went right. It allows us to review those things that went wrong and why. The only problem that I have seen in the after-action report is the great amount of contamination by our own perspectives, which may yield questionable results. The good news is, we usually learn from just the exercise of doing it.

F. CONCLUSION

Project risk management deals with preparation. It is important to identify those things that have potential to go awry. Once they have been identified, develop a plan that will abate the risk. The plan developed may not be exactly what is done if the problem occurs. It is important that you have the plan thought out before the crises occur. Preparation includes the activity of backing up important data and information. The backup needs to be accomplished on a regular basis to minimize disruption in recovering project position in a failure of some kind.

In all that we do in risk reduction, we must always remember two things. First, our supervisor and the customer are always “right.” I have watched many well meaning people take strong stands and get themselves into difficulty with either their supervisor or the customer. You may be 100% correct in your thoughts and risk abatement plans. However, you may be “right” but you may also be “dead right.” Your supervisor or customer may desire to operate with a high or higher level of risk than you are comfortable. The facts are that you have an obligation to advise your supervisor or customer of the risks. They have the option to place the company or themselves at risk. They have the option to have a project take longer, cost more, and with less quality than you had envisioned.