

# Risk Management

The relative nature of risks: An approach to deal with many risks at the same time.

A risk is defined here as a known possibility that could cause harm to current efforts. The process being reviewed allows for looking at a number of risks facing a program or project together. It then assist in developing and tracking mitigation efforts for each risk.

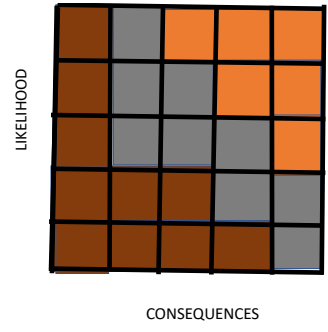
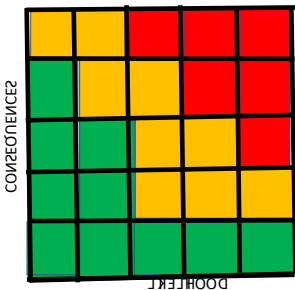
First of all I would like to thank Mike Bisbose and all of you for the opportunity to talk about a Risk Management process I first encountered working at the headquarters of the International Space Station (ISS).

I was the lead engineer for the Resource Management Team. This was a multidisciplinary for engineers who saw to it that the station design adequately received all their function all requirements. Disciplines represented were: Power, Thermal Exhaust, Storage Space, Logistics, Communications and Tracking, EVA, IVA, RVA, Shuttle Middeck Lockers, and Crew Time. There was only one other person from my company on the team. All requirement changes had to go through us to assure that there was the above requirements could be met for all the stakeholders.

I was the only “noncommissioned officer” on the Chief Engineers Staff and if something new came up that the managers did not want to deal with it was sent to my team. This one was supporting a joint NASA/Contractor Risk Management process

All of my team members were tied up with their work so I took on the task myself. That is how I got into Risk Management. The idea was to develop a computer tool and process for evaluating the relative importance the many risks facing the ISS.

I returned to work on commercial airplanes and was was a lead for a group dedicated to developing risk management tool and process. And the implementation of the process throughout the company. Eventually Opportunity Management was added to the process. But, time is short and we will only talk about Risk Management today.

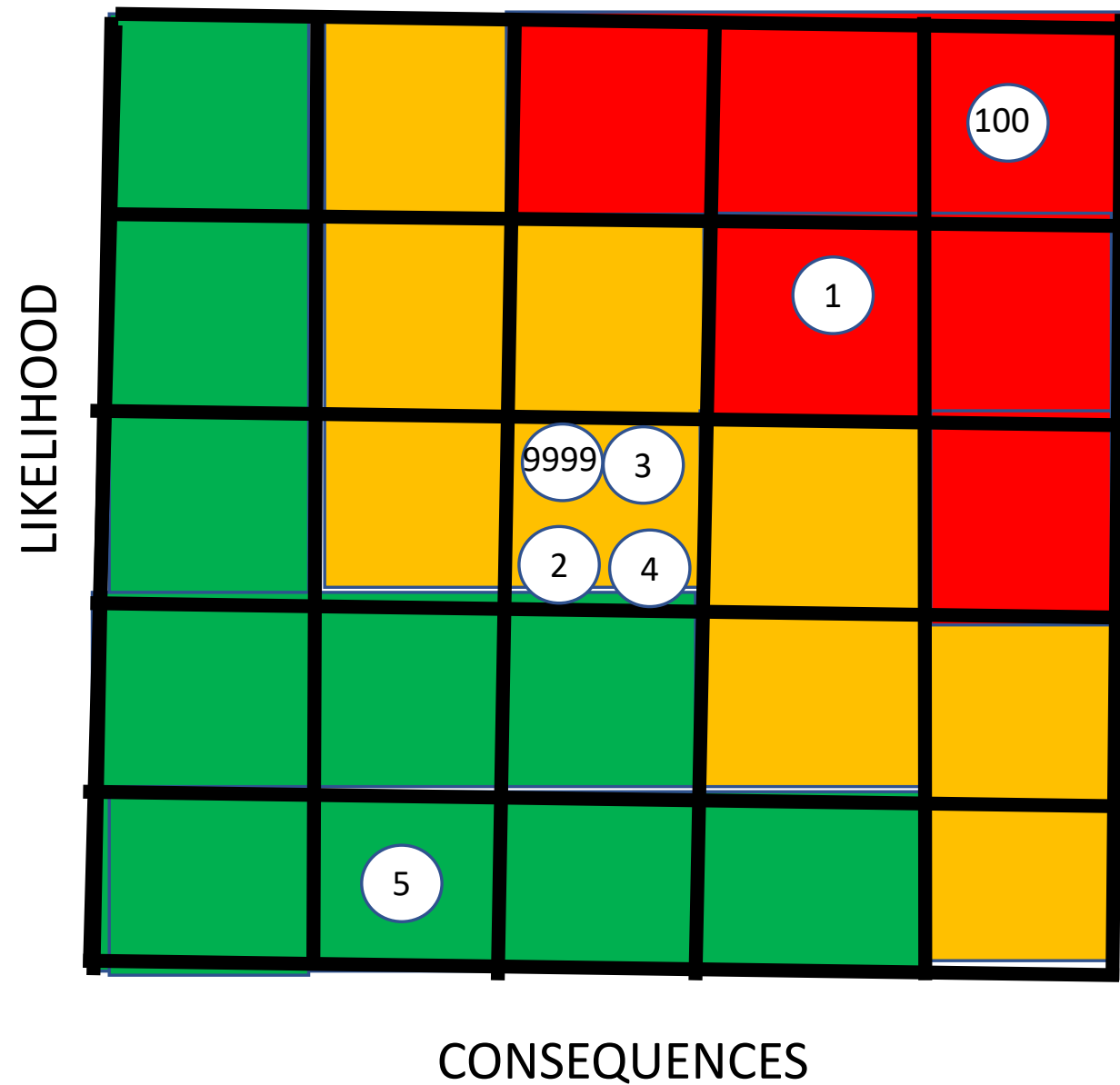


The Risk Management Process described here serves the staff/review meeting. The goal is to help these kinds of groups to better determine how to deploy limited resources on an array of risks.

- o The process allows risk likelihood and consequence to be placed on a 5X5 grid
- o The process gives the team a platform to discuss and change the Likelihood and Consequence levels and add or subtract risks.



The Risk Management 5X5 Grid. Risk mitigation plan titles on side. Have seen as high as 20X20 and as low as 3X3.



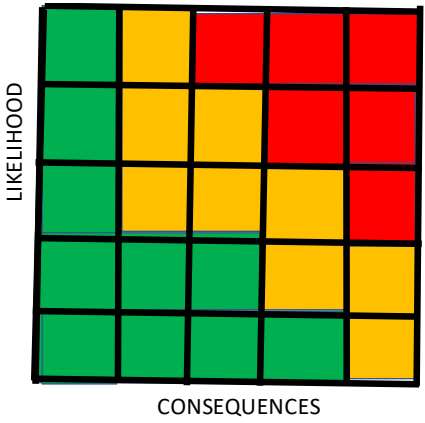
*Example mitigation plan status symbol possibilities*

- 1 Risk title text ..... ✨
- 2 Text text text ..... 🟦
- 3
- 4
- 10
- 99
- 100

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The next slide shows how each risks is defined. The view is of the mitigation plan that would show up if the staff wanted to see details of a particular risk on the 5X5. It can show the progress of the mitigation plan as planned steps are taken to move the risk level towards lower likelihood and/or consequences. The goal is to get the risk to a level where the team leadership can take it off the chart.

Note: The input page for a candidate risks is very similar to the mitigation plan description. The difference being is that there is space for rational about the importance of the risk and an author's proposed Likelihood and Consequence and the rational for that level.



Risk Number *Automatic* Risk Name \_\_\_\_\_ Initial Date month/day/Year \_\_\_\_\_,\_\_\_\_\_.\_\_\_\_\_ *Automatic*

RiskDiscription \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Likelihood Rational (# 1 to 5) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Consequence Rational (# 1 to 5) \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Mitigation Plan Title Description Scheduled Steps, Planned Step Dates,

#	Mitigation Plan Title (40 char.)	Date	
1	Mitigation step title		▼
2	Mitigation step title		▼
3	Mitigation step title		▼
4	Mitigation step title		▼
5	Mitigation step title		▼





Mass Deployment: The More Eyes On The Horizon The More Likely Icebergs Will Be Seen  
 Good Risk Management support tools should be able to handle this sort of roll up from many member of the program team..

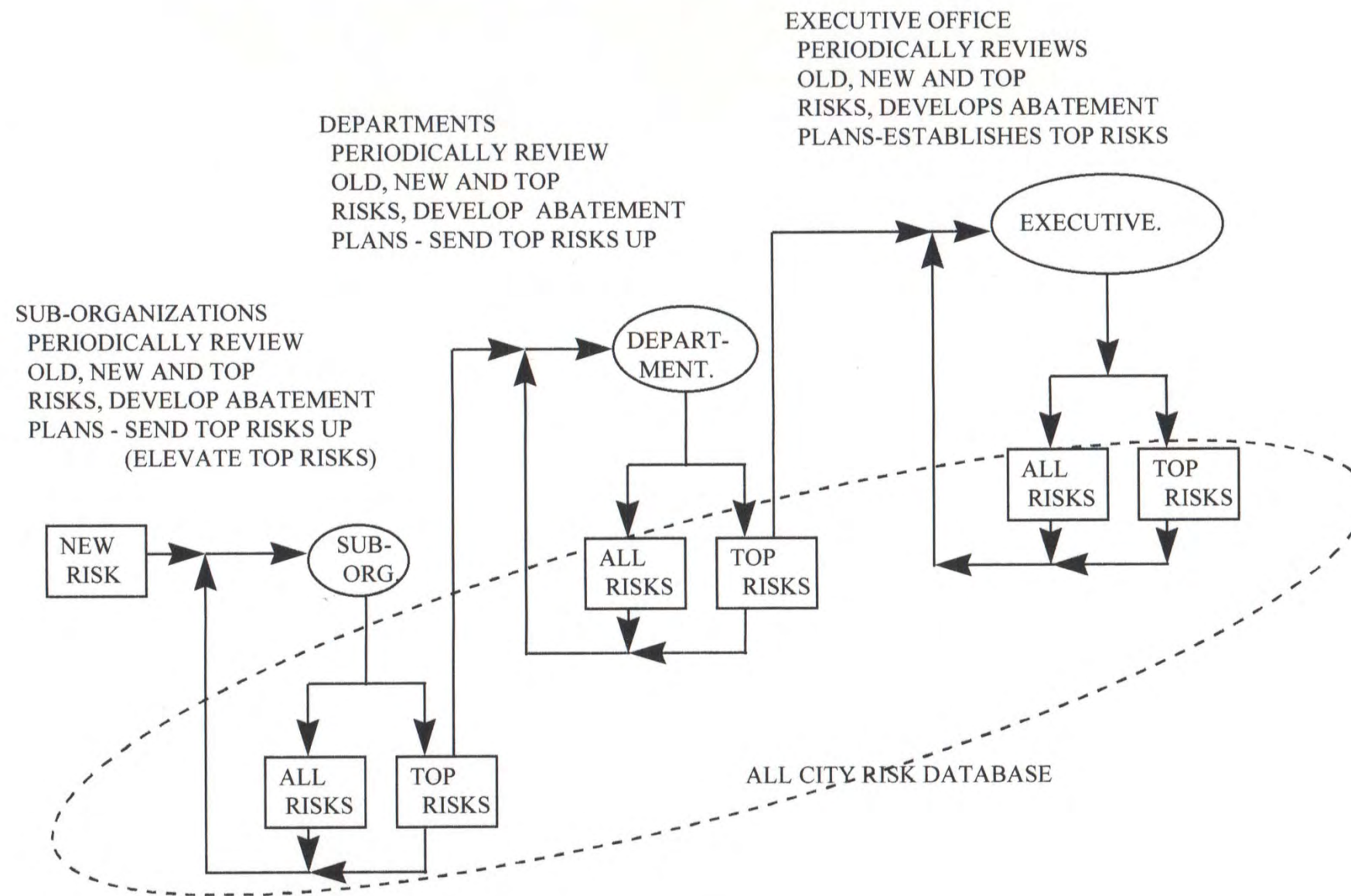


Figure 2. City Risk Process Flow Chart

Carl A.Slater 2/23/98





There are two basic uses for Risk Management

1. Status reporting. This usually flows to the next level up. This usually places it near the end of the staff/review meeting.
2. Real time decision making. This usually puts the risk process at the beginning of the meeting

The next slide describes a use of risk management that was the only thing on the agenda.

A very successful risk identification and mitigation process was carried out for a few years with only the 5X5 with no mitigation plans.

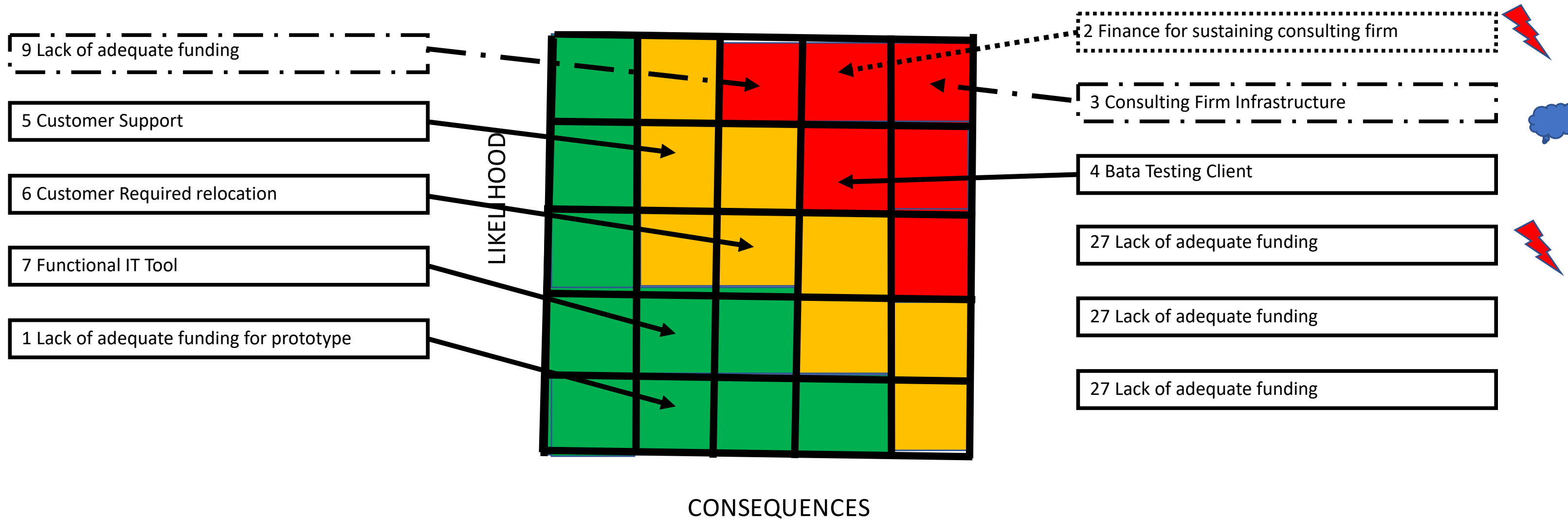
An engineering discipline needed about four thousand engineers to meet its commitments to 18 different programs that needed their type of engineers. These were the sources of their type of engineers.

- o New hires
- o Contractors
- o Reallocation from other teams with lower risk levels.

Every Friday the discipline chief engineers, directors and representatives of the 18 teams would meet. Each team would communicate its risk level to the System Engineering team and a new chart would be developed. Those teams in the red would expect to get people. Those in the green would expect to give up people. Once the chief and the directors accepted the chart then lists of new hires and contract engineers were posted and then names were reallocated.

A concern could have been that all the teams would strive to be in the green. But, from the very beginning each team presented what I considered an honest view.

## Another example of basic chart format



*Probably typical of some risk tools. Mitigation Plan status indicators is shown on the right. The various border configurations show plan status. The solid and various dashed line configurations are for black and white but could also be color coded.*

*I like this the summary chart configuration the best. Although I was surprised at the look of the circles and numbers. From my experience twenty risks is the maximum you can show on a "Summary Chart". When get beyond that I believe you get into trouble in terms of an audience (Staff Meeting, Program Review, etc.) being able to digest the information and be able to make comments and recommendations about the correct allocation of Likelihood and Consequence for the various risks.*



Information cards are particularly important where mass distribution is used. This sample card is from a paper adapting the process to a city.

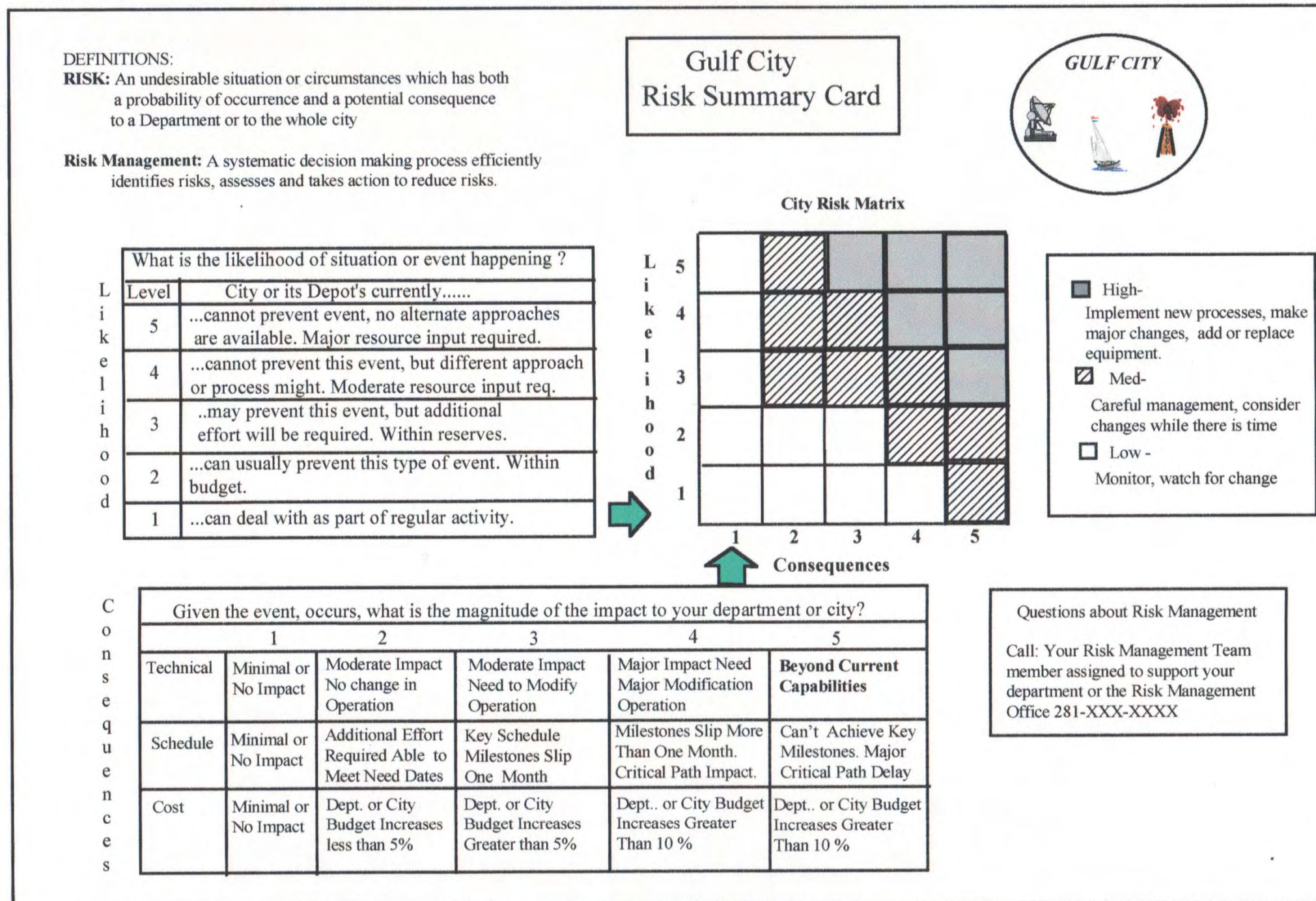
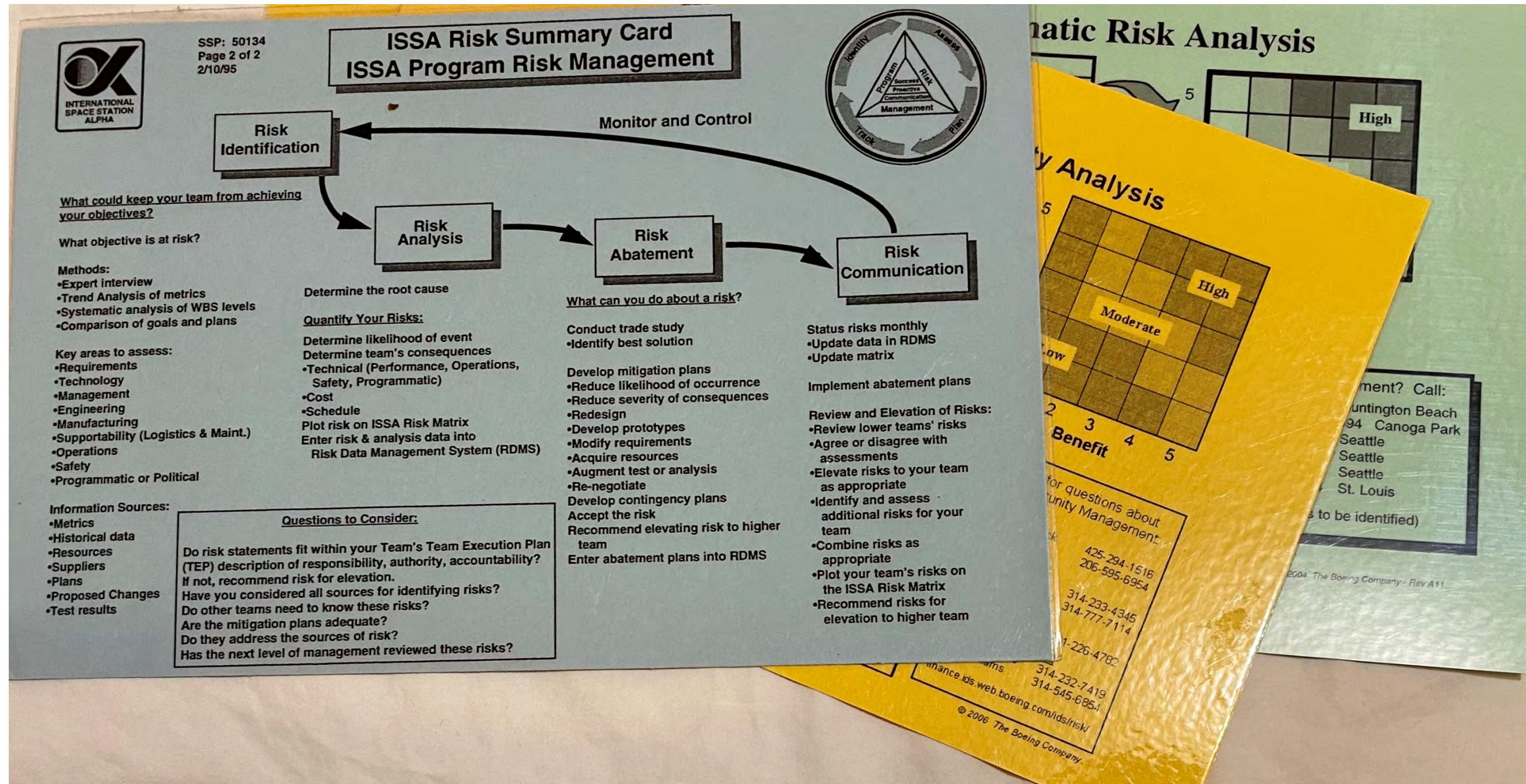


Figure 3. Risk Process Summary Card



The back of the laminated card usually has a description of the Risk Management Process.  
 Note: This card dates when the station was called ISSA (for Alpha)





Near the end

1. I have been involved in the citizen side of: Alternative Energy, Climate Change, Housing, Homelessness, Social Justice, Community Planning, etc. My hope was to introduce this approach to risk management to those communities. In the background I was working on presentation materials for that purpose. Then came the Pandemic and opportunities to meet on this new subject were curtailed.
2. On the ISS NASA encouraged paper writing. To get out to the public things we were doing that might be of use to the greater world. One paper adapting the ISS risk process to an airline and another to a small city.
3. Returning to the commercial side of my company concerns had arisen regarding intellectual property. So external papers were hard to. An internal process was set up for that to give young engineers an opportunity to write and present papers. I wrote one on risk management and one on opportunity management.
4. If you would like to see the kind of charts we produced there you can Google "boris boeing." BORIS (BOEING OPPORTUNITY, RISK, ISSUE SYSTEM)

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Please contact me with questions and concerns. I am very interested in negative comments.

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## Carl A. Slater

BS Oklahoma State Aerospace Engineering MS Public Administration Thesis Model of a “Large Bureaucratic Type Organization”

47 years Boeing, Commercial and military airplanes, NASA and military Space.

- o Engineer Commercial and military product development.
- o Product development 707 and 727
- o Original Space Shuttle concepts had pop-out airbreathing engines sole rep on design studies.
- o Product development work VSTOL Commercial Transports
- o Lead engineer Thrust Management Computer (TMC) and Flight Management Computer (FMC) First digital engine and flight control systems.
- o 777-200 Top Level Requirements Document
- o Requirements documents on various ISS modules
- o Lead Resource Management Team ISS
- o Contractor liaison Contractor/NASA risk management process and tool development
- o Commercial Certification Team propulsion, acoustics and ETOPS
- o Risk and Opportunity Management process, tool development and implementation.
- o Assigned task to champion increased use of digital methods to control production line.