

**Report of the Sixteenth Annual  
Computer Resources,  
Data and Configuration  
Management Workshop**





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# **Report of the Sixteenth Annual Computer Resources, Data and Configuration Management Workshop**

**Sponsored by  
The G-33 Committee**

**Dallas, Texas  
September 20-24, 1982**

  
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## FOREWORD

This document contains the official proceedings of the Sixteenth Annual Computer Resources, Data, and Configuration Management Workshop sponsored by the G-33 Committee of the Electronic Industries Association, held in Dallas, Texas from September 20-24, 1982.

The Workshop program was developed around the theme, "Management Realities in the Face of Advancing Technology." In keeping with the long-standing traditions of the G-33 Committee, this Workshop was dedicated to seeking practical solutions to current problems and to demonstrating foresight in defining the needs for the future. This year the program emphasis was on improving the management of the systems acquisition, operations, and support processes with particular emphasis on the standardization of the management of computer resources-based systems. The Industry and Government panel teams accepted these challenges and dealt with them in an effective manner by developing recommendations for Industry, Industry Associations, and Government as reflected in the body of this report.

Attendance lists for past Workshops have disclosed a significant number of new participants each year. This, coupled with our expectation of additional newcomers from the software CM sector, led us to offer a Computer Resources Configuration Management familiarization course in addition to those already offered for Data Management and Configuration Management. Its success was evident by the high attendance and positive response from those in attendance. There is no doubt that the panel activities benefited from the conduct of all three of these training sessions.

The nine panels of this Workshop addressed a wide range of subjects centered around the 1982 theme. The panel formats encourage the active participation of every attendee and result in an interchange of knowledge and experience that fosters the development of consensus panel recommendations.

The keynote address, delivered by Mr. Richard L. Seaberg, Vice President and General Manager, Sperry Univac, Defense Systems Division, focused on standardization as the way to soften the impact of change caused by a rapidly approaching digital communications world. The text of the address appears in these proceedings.

Luncheon talks by Mr. Bob Jett and Mr. Leroy P. Brunner were of significant interest and greatly enhanced the Workshop program.

On behalf of the Workshop Committee and the G-33 Committee, I compliment the workshop attendees on their professionalism, dedication, and individual contributions to the success of this Workshop.

  
June Wohlgethan  
Workshop Chairman





## G-33 COMMITTEE CHAIRMAN'S WELCOMING ADDRESS

Jerry Raveling

Sperry Univac

Ladies and Gentlemen! A big, warm Texas welcome to all of you - the participants in this the Sixteenth Annual G-33 Committee's Computer Resources, Data, and Configuration Management Workshop. We hope that your workshop experiences, and your stay in Dallas, will prove to be one that you long remember.

Now some of you may be wondering, who's this guy? You can tell that I may be long, and I may be tall; but with my accent, I'm sure you have figured out that I'm certainly not a Texan!

No, rather, I'm the Minneapolis version of J.R.! My name is Jerry Raveling, I'm from Sperry Univac in St. Paul, Minnesota. It is my distinct pleasure and honor to be the Chairman of the G-33 Committee ... The sponsor of this Workshop.

Six years ago, I attended my first EIA Workshop. It was held just a few hundred miles down the road from here, in San Antonio. At that time, I didn't, like I'm sure many of you here tonight, know a G-33 from a mesquite bush. Well, when I left San Antonio, I left with a feeling of excitement. Finally, after all of those years of slogging through battles over baselines, change proposals, hard to read specs, design reviews, patches and recompiles, and tests at three in the morning ... I had found a group that talked my language, and understood my problems! I was at home!!

Since those early days in San Antonio, we've experienced some exciting times. The growth in interest, by both the Industry and Government sectors, in Configuration and Data Management, and Computer Resources, has presented significant challenges to all of us. This past year has been no exception. Our Workshop theme reflects the environment we're working in today. Let's review the events of 1982 briefly:

- We started out the year with a new charter that finally recognized our significant role in the computer resources area, while retaining our past leadership role in Configuration and Data Management.
- The Carlucci Initiatives, or Defense System Acquisition Improvement Program, turned out to be a meaningful, hard-hitting program, rather than the "paper tiger" some thought it might be.
- Activities in the Computer Architecture Standardization area have been on the "front burner" all year and G-33 has been right in the middle of the discussions.

At the same time, each of the military services is making dramatic progress in developing new combat computers.

- ADA, the DoDs new higher order programming language, is real.
- Our own Edie Martin was appointed Deputy Under Secretary of Defense for Research and Technology.
- The long-awaited Joint Logistics Commanders Software Document Package, and the Revised Joint Configuration Management Regulation both hit the street this summer for our review. The Navy also threw us a revised MIL-STD-1679 and the Army asked us to take another look at MIL-S-52779, just in case we were getting complacent.
- Our scope continues to broaden as we experience the impact of the demands of the commercial sector, and the automatic test and computer-aided design and manufacture technology areas.

Being Chairman of a group that is involved in these activities is fun, but it wouldn't be if it weren't for those of you in the audience, plus the people who are sharing the rostrum with me tonight. Let me introduce each of them to you. For the sake of time, please hold your applause until I have introduced all of our honored members and guests. Beginning at my left we have.

- Al Carbone (IBM), The EIA Government Panel Chairman.
- Chris Carbone, Al's wife.
- Chuck McKinzie (Rockwell-Collins), our "front man" in Dallas.
- Dave Erb (Sperry Univac), The Workshop Vice Chairman.
- Bill Dean (Hughes Aircraft Co.), Past G-33 Chairman.
- Bev Dean, Bill's wife.
- June Wohlgethan (The Aerospace Corp.), The Workshop Chairman.
- Dick Seaberg (Sperry Univac), Our Keynote Speaker.
- John Hart (Boeing Aerospace), The G-33 Vice Chairman.
- Carl Hershfield (GTE), The Vice Chairman of the EIA Government Panel.
- Betty Hershfield, Carl's wife.
- Ed Nucci (EIA), Our Support Engineer.
- Ann Nucci, Ed's wife.
- Matt Cohn (GTE), The G-33 Secretary.

Also in the audience are several other past G-33 Chairman. Individuals who have done so much



to bring us to the stature we enjoy today. They are:

- Ron Berlack (Sander's Assoc.), Our G-33 Chairman in 1974/1975 and our current Computer Resources Task Group Chairman.
- Al Lager (Grumman Aerospace), Our immediate Past Chairman and Our Current Configuration Management Task Group Chairman.

Finally, I would like to introduce:

- Nancy Richardson (Hughes Aircraft Co.), Our current Data Management Task Group Chairman.

Thanks to all of you. Our sincere thanks for making this program possible.

Well, enough for history.

Tonight we have an opportunity to begin anew. Through this Workshop, we can chart new ground in our chosen fields of endeavor. I urge you all to participate, to give your best toward providing answers to today's and tomorrow's problems.

Ladies and Gentlemen,

I declare the 1982 Computer Resources, Data and Configuration Management Workshop open and in session.

Workshops like this don't just happen. They require a lot of planning and just plain hard work. This year's Workshop Chairman June Wohlgethan, has devoted countless hours towards ensuring the success of this year's Workshop.

Ladies and Gentlemen, let me introduce our Workshop Chairman, June Wohlgethan. June, it's all yours.

## WORKSHOP CHAIRMAN'S ADDRESS

June Wohlgethan

The Aerospace Corporation

Good Evening ... I extend a warm welcome to you from the Committee of the Sixteenth Annual Computer Resources, Data, and Configuration Management Workshop.

The theme for our Workshop is "Management Realities in the Face of Advancing Technology." Since the mid 1970s we have experienced a dramatic advance in computer hardware and software technology and in the application of this technology in many diverse forms and operating environments. During this period, both industry and government have placed increasing emphasis on improving the management of the systems life cycle processes with particular emphasis given to standardizing the management of computer resources-based systems.

In the next few days this Workshop will examine the impact of advancing technology on current computer resources, data, and configuration management methods and practices.

Must we alter our management approach? If so, what specific recommendations can we make to government and industry to effect and implement these perceived requirements? Where is it appropriate to recommend a standardized or universal approach?

The previous fifteen Workshops are well known for having provided solutions for the issues of their time. This week we have the same opportunity. The nine panel topics represent current issues to which collectively you can make significant contributions in the form of recommendations and the formulation of new or improved practices. Furthermore, each of us should come away from this Workshop with a better understanding of the comprehensive applications of computer resources management, data management, and configuration management.

I personally wish to thank the Workshop committee members for their efforts, advice, and counsel during our year-long preparation activities. I also extend thanks to the Panel Co-chairs and Recorders for their excellent work in defining and developing panel tasks. I especially want to thank Dave Erb, my Workshop Committee Vice-Chairman for Panels, Nancy Richardson and Chuck Feeley for the Data Management Familiarization Course; J. Bill Dean and Carl Hershfield for the Configuration Management Familiarization Course; and Ron Berlack and Rick Frederick for the Software Configuration Management Familiarization course; along with Chuck McKinzie, Dallas Liaison and Ed Nucci of the EIA staff, all of whom have

done so much to bring the Workshop plans to fruition.

And now for the highlight of this evening, our keynote address. Earlier this year when the Workshop Committee began the search for a Keynote speaker, we set some basic selection criteria. Our Keynoter should be a person who:

- Has significant experience in the career field that would have direct application to the theme and purpose of our Workshop.
- Is a recognized leader in Industry or Government.
- Is a hands-on Manager who is familiar with today's business environment.
- Is an individual who comes to us highly recommended as a speaker.

Our speaker tonight, Mr. Richard Seaberg, Vice President and General Manager of Sperry Univac, Defense Systems Division, certainly meets, and we believe exceeds, all of the criteria we established. Mr. Seaberg is a contemporary manager and a recognized Industry leader. As a member of EIA Board of Governors and Vice Chairman of the EIA Government Division Board of Directors he is fully committed to the EIA and to activities of G-33.

Ladies and Gentlemen, let us all benefit from an expert in Computer Resources Management ... our keynoter ... Dick Seaberg.



## KEYNOTE ADDRESS

Richard L. Seaberg

Sperry Univac, Defense Systems Division

Good evening, Ladies and Gentlemen. It is a distinct privilege and a pleasure for me to keynote this, the Sixteenth Annual EIA Workshop on Computer Resources, Data, and Configuration Management.

It is a privilege for me to share a lectern that in preceding years has been the place of many of the recognized military and industry leaders of our nation. This is a humbling experience and I appreciate the opportunity to appear before you and share some thoughts on standardization.

And it is a sincere pleasure to address you, the participants of this Workshop, and your special guests. Your efforts this week, in developing recommendations for solutions to the issues that are the subject of each panel, are extremely important. You can, and I am sure you will, make a definite contribution toward improving the management and control environment in which the systems of tomorrow will be designed, developed, tested, and implemented. When we talk about defense business, when we implement systems, it's a life and death situation.

We are living in some exciting yet turbulent times. During the next few years, we have what I believe is an outstanding opportunity to exploit the significant advances that have been and will continue to be made in technology, and to contribute to the economic and defensive postures of our country. In doing so we will, and we must, face major challenges ... particularly in the area of computer-based systems.

The lines that once separated data processing, telecommunications, and a host of other electronics related applications are beginning to blur ... the industry is moving toward the broader areas of information processing and management. What I like to say is that we are quickly becoming a digital communications world. Let's review some of the changes that are occurring:

In terms of size; the trend of computer systems is toward smaller and smaller packaging. Large Scale Integration and Very Large Scale Integration, or LSI and VLSI, have already reduced and will continue to reduce the size, weight, and power requirements of computer systems. This reduction in size has been accompanied by an increase in processing power. We are seeing more and more logic gates being packed onto a single chip. Today's desk top computer, the basis of office automation, will soon be a pocket computer!

Environmentally; computers are being adapted to operate in other than clean, air conditioned rooms. Temperature, humidity, shock,

nuclear hardening, and ruggedization improvements are supporting the use of computers in what only a few years ago would have been considered "hostile" environments.

With respect to reliability; significant improvements in the reliability of computer systems ... both hardware and software ... have been experienced in recent years. Mean Time Between Failure (MTBF) experience factors have soared. The truly fault-tolerant computer, or the computer where  $A_0 = 1$ , is becoming a reality. We can do it today ... but it's expensive!

Similarly, through modular design of both hardware and software components, we have been able to make measurable improvements in maintainability ... reducing the Mean Time To Repair (MTTR) of our computer resources.

The reduction in size and power requirements will aid us in our efforts to provide greater security from the compromise of electronic emissions. Data security is also being enhanced by a combination of software, firmware, and hardware.

Laser, semiconductor, fibre optics, memory, and cryogenic technologies are all making impacts on future products. Many of the products we will be concerned with five years from today do not even exist in the research labs of the nation.

And finally, for purposes of this quick review, much has been stated in recent years about the changing cost ratio between computer hardware and software. It is true that the cost of computer hardware is decreasing, but at the same time ... because of the increasing complexity of our systems ... design and software costs are escalating rapidly. Reductions of the overall cost of our systems is, therefore, doubtful.

Improvements in software productivity will continue to be our number one problem related to systems cost.

What are, as stated in your workshop theme, the "management realities in the face of advancing technology?"

Certainly, as our factories, offices, aircraft, tanks, ships, and submarines become more computerized ... more automated, a tremendous need will be created to manage the vast amounts of additional information that will be generated. The challenge will be to manage the collection and processing of the information and to get it out to the people who need it. Systems will become more user oriented. It has been estimated that by 1985 over 75 percent of our nation's work force will be working with computers.

But, I'm getting ahead of myself. I've just been talking about the glamorous end of the business, and as most of you know, the real management challenges lie out of sight of that sparkling new computer, that exotic microprocessor, or that breathtaking color terminal.

The tough problems, those that you and I must solve, are where they've always been ...

- In the research labs ... How do we bring the new technologies from the labs into production? Where do we find the right people to do the job?
- In the planning and budgeting process ... We must understand the fundamental limits of our technology environment so as to enhance the strategic decision process. Our business is becoming highly capital intensive. The stakes are high when it comes to determining how, when, and where we invest our finite resources.
- In subsystem and system design ... There is often a significant time lag between the development of a new technology and of its use in a system. This gap, in the face of tough competition is narrowing but, at the same time, our risks are increasing.
- Our problems also lie in our plants ... on the factory floor or at a programmers workstation, or ...
- Someplace, somewhere out there with the pilot of an F-16, the weapons officer on one of our AEGIS cruisers, or with the GI in the foxhole.

This, then, is where the true management realities lie. How can we cope? What must we do to meet these exciting challenges?

In thinking about and examining the overall problems of our computer resources environment, there was one factor that seemed to keep popping up ... regardless of where I looked. This all pervasive factor was STANDARDIZATION!

Think about it for a moment. I believe that you will find, as I did, that standardization impacts almost every facet of your life ... it has become a way of life and, for many, a way for survival!

When Chrysler was having trouble a few years ago, a large part of the Iacocca solution revolved around standardization ... design, production, and distribution. We see the evidence and experience the effect of standardization ... in our homes, offices, the shopping center, and in the very food we eat. Last week I had a Big Mac, french fries, and a strawberry shake in Sydney, Australia. Talk about standardization! If I had closed my eyes, I'd have thought I was in Minneapolis, Minnesota.

The Department of Defense has always been an advocate of standardization, but in the recent years, we have witnessed a significant increase in interest and emphasis. Knowledge of the need for, and the benefits of, standardization are becoming well established. I was frankly a bit surprised at the level and magnitude of involvement we found in the DoD's standardization programs. We were, of course, intimately familiar with the system

acquisition and mission critical computer resources initiatives that you in the G-33 have been so actively involved in: DoD Directive 5000.29 on Computer Resources Management, DoD Instruction 5000.5X on Instruction Set Architectures, DoD Instruction 5000.31 on Higher Order Languages and, of course, the major Joint Logistics Commanders software documentation project you have, and will continue to be looking at this week.

We have also given a great deal of time and thought to the DoD's Acquisition Improvement Program, or Carlucci Initiatives.

Did you know, however, that the DoD is also pursuing standardization in such areas as printing, munitions, packaging, audio-visual equipment, interfaces, aircraft stores, peripherals, and construction equipment?

Why all the emphasis on standardization?

Well, as recently indicated by Deputy Under Secretary of Defense William Long:

- The Nation, and the President, face an extremely difficult task ... controlling the budget and yet at the same time, satisfying our defense needs and the defense needs of our NATO allies;
- Also, there is the vital importance of ensuring that U.S. Industry, the Congress, and the DoD spend each defense dollar wisely to ensure that we get the needed equipment into the hands of our combat forces.

Continuing, Mr. Long stated that they ... the DoD ... were firmly committed to making the acquisition process as effective as possible. Importantly, he stated, that "standardization plays a key role in this regard."

What are the objectives of standardization as outlined by the DoD? They are four in number:

- To improve the operational readiness of the military services by increasing the efficiency of design, development, material acquisition, and logistics support.
- To conserve money, manpower, time, facilities, and natural resources.
- To minimize the variety of items, processes, and products that are associated with design, development, production, and logistics support of equipment and supplies,
- And finally; to enhance interchangeability, reliability, and maintainability of our systems.

Is it working, and will it work in the future? Well, like almost any situation you encounter, the answer to that question depends on who you ask. Each of the people attending this workshop will approach the subject of standardization in a different manner ... we bring our own particular perspectives, motivations, incentives, and biases to the subject. These differing criteria are important to understand when working on, or discussing, standardization issues. Let's look at some popular views. Perhaps you will be able to identify yourself with one or more of them ... the views can serve to either be impediments to, or supportive of, standardization.

From the Contractor's point of view, he may ask: "How can I meet your stated requirements when I'm tied to using your standard? I've lost my design flexibility ..."

... but then again, "maybe through use of the standard, I can make the job easier, reducing the cost and complexity of the design!"

The Program Manager may say: "Of course I believe in standardization, as long as it doesn't impact my schedule or budget! However, perhaps standardization will support meeting my mission and MTBF requirements, enhance the delivery schedule, lower my risks, and keep me within budget."

From the Engineering perspective: "You're stagnating technology through standardization ... now if you'd only let me use the latest micro-processor from XYZ!"

Selecting the best way to do something is an engineering function. Today many engineers realize that the job can be done when standardization is properly applied, and it helps them overcome their two biggest headaches ... cost and schedule. Further, through Pre-Planned Product Improvement or P<sup>3</sup>I, we can still provide for the introduction of advanced technology, if we plan for it in our design.

And the User may say: "Standardization is great, but unfortunately my situation is unique ... you see, I've got this timing problem and the new enemy ECM gear is the best we've seen - (pause) then again, if I use the standard, I won't need 30 new programmers, my training costs are minimized, and I can be certain the system is really going to work."

These have been examples of pro and con arguments from a number of perspectives. Another question everyone asks is: "Who else has used this standard?"

Everyone wants a mature standard prior to implementation, but standards only mature through implementation.

This last point is an interesting one. Not too many of us want to be the first user of something, yet in order to find out if it's any good, there is no substitute for actual experience.

Let me summarize why I believe DoD is interested in standardization. If we look at the computer and software area, we find the benefits will include:

- Avoidance of unnecessary proliferation of computers and software languages. With approximately 700 different types of computers and 150 different software languages currently in the DoD inventory, it is obvious that significant reductions in this proliferation are mandatory.
- Reduction in life cycle costs, through reduced sparing requirements, fewer computer architectures to support and the availability of good, reliable support software.
- Reduced software risk and long-term support for software transportability.
- Improved system combat availability, survivability, and maintainability.
- Simplified logistics and training.

- Computers and software that are specifically designed for military applications and environments.

While equally significant, one does not often hear about such factors as:

- Improved productivity resulting from the engineering and manufacturing experience curve. We at Sperry Univac Defense Systems have seen, for example, dramatic improvements in the reliability and productivity on our AN/UYK-7 and -20 programs over the past several years. We have gained over 10 years experience on these two computers.

We have more than doubled the MTBF on the AN/UYK-7 Computer over the last five years. That figure now stands at 5600 hours. Over the same timeframe, we improved our AN/UYK-20 MTBF by a factor of 8 - to 9400 hours.

Another learning curve statistic: when we first built the AN/UYK-7, it took us over 15,000 labor hours to produce one computer; today that labor content is less than 6000 hours - That means that today we're building 2-1/2 AN/UYK-7 computers in the time it took us to manufacture one, a little more than a decade ago.

Other standardization benefits include:

- Expanded support software suites developed for established architectures - these offer greater development and maintenance capabilities and support.
- Establishment of a stable manufacturing base providing lower production costs, retention of experienced personnel, and a stable parts supply environment. Again going back to the example of the AN/UYK-7 and -20 computers, we have supported a vendor base of 1000 suppliers. That means the better suppliers have been kept in business for a long period of time providing stability at the lower tiers of suppliers, and thereby, supporting the retention of proven suppliers of MIL qualified parts.
- Increased software and hardware reliability and availability resulting from extensive distribution, quality reports, and use of the product.
- Standardization allows an organization to establish engineering groups ... product, systems, and field engineering ... which develop a tremendous amount of knowledge of the equipment and its software.

The results from standardization are real; they're measurable. As such, I truly believe that standards are here, and here to stay. The benefits of standardization for the DoD are all too pervasive for them to change their course. The same can be said about the commercial environment. Our commercial cousins, after all, invented standardization!

This then is our management reality! We must learn to design, build, operate, and maintain our computer systems in a standards environment.

In saying this, I do not mean to imply, that we in industry must embrace fully each standard without question or without offering alternatives. Rather, we must work with the DoD:

- To ensure that standards do not impose excessive inhibitions on the design process.
- To explore alternate methods of implementing the standard (i.e., certification, second source, etc.).
- To develop standards that are flexible, which accommodate the development of our systems, which recognize the differing size, scope, and the complexity and criticality of the application areas in which they are to be used.
- To identify deficiencies in existing standardization policy, guidance, organizational structures, and acquisition management practices.
- To recommend the development of incentives for government and industry managers to effectively use existing standards ... to make life cycle cost, system reliability, maintainability, and availability of greater importance in the source selection process, and not just low price.
- To effectively tailor RFPs, specifications, and standards to ensure that we meet requirements but do not expend funds unnecessarily for system capabilities that are not required by our combat commanders.
- To use industry standards rather than MIL-SPEC standards whenever feasible.
- To promote greater industry involvement in the standardization decision process.
- To improve and streamline the acquisition process.

Through Committees such as the G-33, and through Workshops such as this, we can do much in accomplishing these objectives. I challenge you, the attendees at this workshop, to achieve your individual and panel objectives, to critically examine the issues before you ... I'll look forward to reading your report and your recommendations.

Thank you June for this opportunity to be with you. My sincere thanks to each and everyone of you for your attention and interest. The results of your workshop are exceedingly important. These results will allow us to successfully meet the management realities each of us will encounter.

My very best wishes to you for an exciting and productive workshop.



## CHARGE TO THE PANELS

David M. Erb

Sperry Univac

Good morning Ladies and Gentlemen. As Vice Chairman of Panels at this workshop I am allowed a few minutes at this time to address you as a group and pass along some words of wisdom concerning what our workshop panels are about and how they are conducted.

First of all, I think it very important to emphasize the fact that this is a workshop, and by no means lectures by nine different groups of people on their favorite topics. The popularity of this type of effort (workshop) is evidenced by the number of participants. For those of you here for the first time I will emphasize again the fact that it is not a week long tutorial by a panel chairperson to drive home a point. Panels are born during the year preceding each workshop mainly by industry and government participants in G-33 discussing their day-to-day, job-related functions. (You will note that each panel has both government and industry people in charge of each panel). As we all know, a discussion of this type usually results in those involved relating their problems and solutions to those problems. Of course, depending upon the evaluator, one solution may be better than another, but the key is they were probably both accepted by the customer, and in most cases the customer was part of the solution.

These discussions then result in an industry and government representative close to a problem agreeing that either a problem exists or a particular situation is looming on the horizon and potentially will leave both contractor and customer grappling with an unnecessarily complex situation.

From these real life situations then, come our panel subjects. Panel leaders have done their preparation as evidenced by the panel outlines, schedules, and strawmen discussions you have or will receive. These outlines and strawmen are designed to serve as guidelines to keep the discussions moving toward a conclusion on Friday. The most important thing to remember is to contribute. Each panel member's view is needed. The more people who speak up during panel sessions the better the outcome.

Quickly now, the way it should go during your panel session, is this. Each panel objective is laid out in your handout folder. Reaching the objective is termed a success when the discussions are kept on track and personal experiences are shared.

In closing, and at the risk of being redundant, I will mention again that (1) the workshop

subjects are set, everyone must pull together to keep the group on the track. (2) The time allowed cannot be wasted; Tuesday, half of Wednesday, and Thursday is all we have. (3) If you don't have your discussions organized and documented before 8:00 a.m. on Friday morning, you run the risk of not reaching your goal.

