

Interoffice Correspondence

<u>Subject</u>	<u>Date/Reference</u>	<u>From</u>
Report on EOS Lessons Learned Survey	December 13, 2002 PEB.200212.063	P. E. Brandinger <i>PEB</i>
<u>To</u>	<u>cc</u>	<u>Location/Phone</u>
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On 26 November 2002 a survey was sent out to approximately 550 EOS Project staff (including both civil service and contractors) to obtain feedback on the following general questions:

1. How could a lessons learned system help you?
2. How would you prefer to obtain lessons learned?
3. What types of lessons learned information would you find most useful?
4. What additional sources of information would be useful to you?
5. What would encourage you to contribute to and use a lessons learned process?

A total of 59 questionnaires have been received to date, Attachment 1 summarizes the number of responses for each question.

In addition to the surveys several respondents provided comments associated with lessons learning within the EOS environment, these are included in Attachment 2. Separate discussions were held with a Code 581 representative regarding previous development of a lessons learned repository, the feedback that was provided is included in Attachment 3.

Key survey results indicate the following:

1. The majority of EOS Project staff consider that a lessons learned system definitely could help them:
 - a. Gain benefit from prior experience (78%),
 - b. Share what they have learned with others (68%), and
 - c. Find information more quickly and identify people in GSFC with relevant skills (~50%).
2. 78% of staff would definitely prefer to obtain lessons learned through searching an online database.
3. Staff would definitely find specific lessons learned occurrence reports to be most useful (68%).
4. Most staff would definitely find Project documentation and identifying GSFC points of contact with specific skills to be useful (~2/3).
5. More than 2/3 of the staff would definitely be encouraged to use a lessons learned process to improve their job performance.

Figures 1 – 24 indicate the percentage responses to each question.

Attachment 1

How could a lessons learned system help you?	1. Find information more quickly 2. Gain benefit from prior experience 3. Share what you have learned with others 4. Identify people in GSFC with relevant skills	Definitely 28 Definitely 46 Definitely 40 Definitely 27	Maybe 27 Maybe 13 Maybe 19 Maybe 26	Unlikely 2 Unlikely 0 Unlikely 0 Unlikely 5
How would you prefer to obtain lessons learned?	5. Search an online database 6. Have relevant information sent via email 7. Through stories told at workshops and brown-bag lunches 8. Availability of online videos from workshops and other meetings 9. By access to informal mentors and retirees 10. Via an online community sharing common interests 11. Using interoffice mail 12. Having someone call	Definitely 46 Definitely 13 Definitely 12 Definitely 6 Definitely 20 Definitely 16 Definitely 7 Definitely 4	Maybe 10 Maybe 25 Maybe 28 Maybe 32 Maybe 27 Maybe 32 Maybe 19 Maybe 22	Unlikely 3 Unlikely 9 Unlikely 18 Unlikely 29 Unlikely 9 Unlikely 11 Unlikely 32 Unlikely 32
What type of lessons learned information would you find most useful?	13. Specific lessons learned occurrence report 14. Project-specific reports; after-action, independent review team, etc. 15. Compendium of common threads 16. Sharing personal experience	Definitely 40 Definitely 35 Definitely 17 Definitely 28	Maybe 16 Maybe 19 Maybe 32 Maybe 28	Unlikely 3 Unlikely 5 Unlikely 4 Unlikely 3
What additional sources of information would be useful to you?	17. Documentation on current and previous projects 18. Ability to identify who in GSFC has specific skills 19. News related to Project activities 20. Project/Center Library and CM system references	Definitely 37 Definitely 40 Definitely 20 Definitely 25	Maybe 18 Maybe 13 Maybe 22 Maybe 27	Unlikely 4 Unlikely 6 Unlikely 16 Unlikely 6
What would encourage you to contribute to and use a lessons learned process?	21. Opportunity to improve job performance. 22. Peer recognition of the value in sharing lessons 23. Incorporation as part of the annual review process 24. Cash bonus where tangible benefits can be demonstrated	Definitely 41 Definitely 20 Definitely 8 Definitely 25	Maybe 14 Maybe 29 Maybe 31 Maybe 15	Unlikely 3 Unlikely 9 Unlikely 17 Unlikely 17

Attachment 2

Comments in Response to Lessons Learned Survey

A concern I have is that once such a database (?) is generated it sort of 'goes away'. I have mentioned to my mgmt the idea of having a tech writer attached to a flight team, (and especially a new, pre-launch team) to handle document writing and file generation such as envisioned in your message. This mentioned effort would include adhering to ISO, company, other standards and be in compliance. This could include such a lessons learned db. It is my observation that an engineering staff - especially young engineers, do not write well and generally don't like doing this. Having a tech writer attached to a team would help in this area as I envision the writer actively working such issues with the team/engineering staff. This individual would be our contact to a lessons learned db and other areas of common interest.

The incorporation of lessons learned in our daily activities must become second nature to how we think, plan, make decisions, and do business in general. A good idea, but difficult to incorporate so it would be useful and unbiased. Lessons learned often get sanitized to the point they have no value, this happens for many reasons. Individuals who apply lessons learned will be rewarded by having the opportunity to improve their effectiveness in the work place. Ultimately resulting improved job satisfaction.

For "Additional Sources of Info," it might be useful to have data on Risks identified by other projects, as well as metadata from the IV&V team's findings for other projects. As for "What would encourage you," I would suggest that having the full support of the project manager, as well as the expectation that the participation in the Lessons Learned process is just another part of doing one's job, would both contribute to wider use of the system. FYI, since 1991 I have participated in the meetings of what is now called the EOS Software Advisory Panel (ESWAP). We began meeting to work on issues related to the Software Management Plans and Requirement Documents for 420 and 421. However, as EOS grew, we quickly expanded to a group that meets roughly quarterly to discuss the software status, issues, and lessons learned of Terra, Aqua, Chem, ESDIS, and the PVVF. The meetings are attended by the various project software managers, their support contractors, and the project's software quality engineers. This seems similar to the "brown bag lunches" mentioned in the survey as a method for sharing information.

The current EOS library is a good start. It has been useful in the past. Good place to put lessons learned.

Remember lessons learned 101; you've got to make it interesting and Project Managers have to support it.

I'm not a big one on these supposed formal mandated approaches for lessons learned. They really just add bureaucratic requirements and cost onto existing bureaucratic requirements and cost.

Having them available on line would be useful but whether one could ever come up with a taxonomy that would make searching complete and easy is an open issue.

But, what worries me most is that this is appearing to be a top-down rather than a bottom-up way of dealing with these issues. Mandated top down approaches will never really work in a meaningful way. Instead, it will just lead to sign-off on a requirements list. If the desire isn't from the technical folks, then management can't create that desire.

The survey didn't really capture what I think is the most important thing to capture--the best practices of what we do. Specifically, a system where I can find out what things I should be doing and what I should be worrying about right now, so it should somehow be based on the phase of the mission.

I really believe that with each formal review (ie MOR, FOR, ORR, etc) there should be a one hour presentation on lessons learned (from a similar Mission). Maybe it should be the first presentation - and include areas for the review board to watch/consider. A success criteria for the review can be whether all lessons learned were adequately addressed.

Working a development project leaves little time for "stories told at workshops" or "on-line community sharing"; I like the idea of an on-line searchable data base for looking up specific issues, and a data base of special people is good, although to be effective they would have to be approachable/available.

I commend your initiative to develop a lessons learned pilot for the EOS Projects. The only problem is that you are at least five years too late. The Centerpiece missions of EOS, EOS-AM (Terra) and EOS-PM (Aqua) have been launched and the staff disbanded. With very few exceptions, the people instrumental in putting together these missions are no longer available. I am one of the few people remaining who have worked with the EOS Projects from their inception. Personally, I could fill a book with lessons learned regarding instrument technology development. Regrettably, I do not know how much use this would be as NASA's current strategies do not encourage in-house instrument development.

"The only lessons learned are that we don't learn any lessons" (here at Goddard). To be successful, in my opinion, we need to make this part and parcel of the Goddard culture--which means it will take several years. (As a footnote, I've just documented my experiences [Terra, Aqua, ICESat] as the Mission Readiness Manager into a "Practical Handbook" for future MRMs. We hope to take the lessons learned and apply them to the upcoming Aura mission.)

The one thing I am very adamant about is the use of lessons learned as part of a personnel annual review. This would cause people to make lesson learn reports for their annual reviews. Major lessons would be clouded over by all the minor lessons learned.

As for using a web based search system, I once typed in the title of a document that was on line at GSFC, after 20 minutes, I cancelled the search. A second search a day latter produced results after 15 minutes but did not come up with the document. Needless to say, I am not impressed by on-line search mechanisms.

How could a lessons learned system help you? (For development and improvement of guidelines)
What type of lessons learned information would you find most useful? (Need a pre-defined structure for classification of lessons learned)

As a communications et al person, I find that we have lost compatibility lessons learned. All projects may do the RF compatibility testing, but the information and any lessons learned are lost and not shared. All proposals of new work have left compatibility as a buzz word and maybe someone else but me brings it up so it could be included. Even if compatibility was performed, there is no library, office, or sharing of this information to all projects or at least to the review boards by a process. Someone has to bring it up, and there are very few people left that would. We used to have an office which worked hand in hand to all the GSFC. Now you have to go out of your way to find it if it is still there. I'm looking to find it, maybe in Code 450. It has even been removed from the timecard authorized charge number list.

Other thoughts on the subject:

1. Introductory watch-out! briefing package: when assigned a new job, provide info package reviewing the key problem areas for special attention, i.e. the areas that generated lessons learned on similar assignments in similar development efforts.
2. Searchable databases would be very important I think. I find little time to read routine publications that routinely recount lengthy lessons learned.
3. Seems to me also that some kind of Index routinely delivered that is scannable for topic relevant items. A Bulletin of short summaries, similar to Alerts for suspect materials or processes I believe.

Project-specific reports; after-action, independent review team, etc. [but too long and they are most likely ignored due to time crunch of other duties]

Attachment 3

Additional Comments from Code 581 Experience with a Lessons Learned Repository

First of all, Lessons Learned is just a small part of a larger suite of information (and other corporate assets) that should/could be shared across any organization.

My simple response to the question posed in the previous email is "We don't".

The more complex answer to the question must necessarily get into "Why not?" It is certainly not because we believe it is a bad idea, nor is it because we are not committed to doing it. Quite the contrary. I personally have spent much time over the last 10 years trying to make this happen, and not just in the lessons learned area. I was directed to do so by management at all levels. They all believe that there is much benefit to be derived from such a system. So why didn't it happen?

The information below is based on my limited experiences dealing with this issue, the first in developing the Project Information Exchange (PIE) prototype for the old Code 500 directorate, and the second in being chartered to develop the System Support Process (SSP) for the "reengineered" (shame on me-Process Improved) old Code 500.

The overall problem seems to break down into two parts: How to get "Good" stuff in, and how to "best" get the stuff out. Assuming you can get pass both of these obstacles, you must then address how one keeps the information accurate and current, given the rate of change of technology (and everything else). And finally you must make a ROI business case.

I believe (and am convinced) that the simple answer to "Why not?" for the first part of "how to get good stuff in" is that people fundamentally do NOT want to "SHARE" - they want to "GET"! Most of the problems in obtaining "good" information to place in such a data repository derive in some way from this one statement. The second part of the problem, those that "get", seems to be centered around the issue that people would rather talk to "people" to get information than have to find it themselves in a data repository, of any type.

Many have tried to put together such data repository and most fail. We conducted a study within Code 500 to try to find out why. I may still have the results of that study. The fundamental conclusion of the study was that to get "good" stuff in you must have a "good" carrot, not a "hammer". We could find none. We also found that the serious "getters" of the information would rather talk to someone about their specific needs/problems than dig it out of any data repository themselves, as mentioned above. This meant that any data repository was for use by the provider, not the receiver of the information, and therefore should be designed to accommodate the provider as needed (if at all).

Our recommendation to the directorate was to NOT build a data repository, and we hadn't even gotten to the business case yet. What we did reconfirmed was a System Support structure (and Process) that involved people whose job it was to be knowledgeable about corporate assets (including lessons learned). This was initially recommended by a Code 500 reengineering team looking at new ways of doing business. While we practiced this concept in a small prototype fashion for a couple of years with good success, it is still currently not part of the culture. With diminishing funds and full cost accounting, the likelihood of its happening is even less. The ROI business case, if only assessed across Goddard sponsored missions, is just not there.

The concept of Lessons Learned itself seems to have some additional problems based on my limited experiences with PIE and trying to have to populate this type of information. Even if you can get past the "sharing" and volatility problems discussed above, you seem to run into the difficulty of people not knowing what to share, or how to abstract their problem for general applicability. You just can't throw lots of crap out there and expect people to wade through it. Dumping multi-page lessons learned documents from projects onto a database doesn't cut it. It must be organized, crisp, and clear for easy extraction and digestion. And that takes time and effort from a third party who understands what is important, if you want consistency across the database. The problem is further complicated in that most people don't prepare lessons learned until the end of a project and by that time much information from previous phases are lost due to forgetfulness or personnel turnover. Often lessons learned are not gathered from across the team, especially since they may be disbursed after particular phases. Due to culture, personal preference and the not invented here syndrome, there is also a class of potential "getters" that won't "get". And finally you have the ROI issue. To be effective, I believe the Lessons Learned must be collected as they are experienced. It requires the sharing of the information by everyone involved, and thus must somehow be an integral part of the development process, not just a closeout document.

I tried the data base approach once and failed. I led a team to try again several years later, studied why I and others failed, tried to solve the problems, and still was told by a panel of peers that our proposed data base approach would fail again. But at least now I think I know why. I believe it is just part of human nature. If the directorate or Center is going to follow through with this, they should at least benchmark someone who has made it work for them, technically and financially.

Figure 1
How Could a Lessons Learned System Help You?
Find Information More Quickly

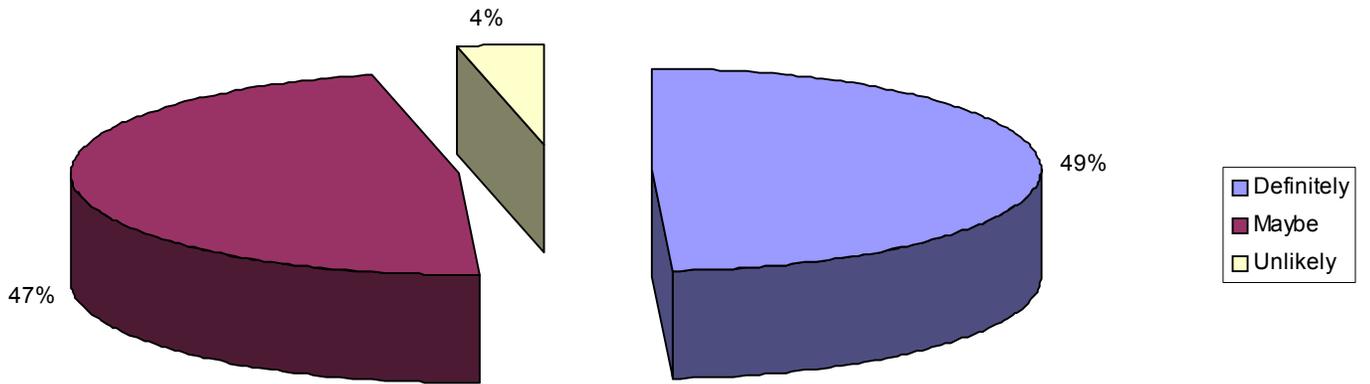


Figure 2
How Could a Lessons Learned System Help You?
Gain Benefit from Prior Experience

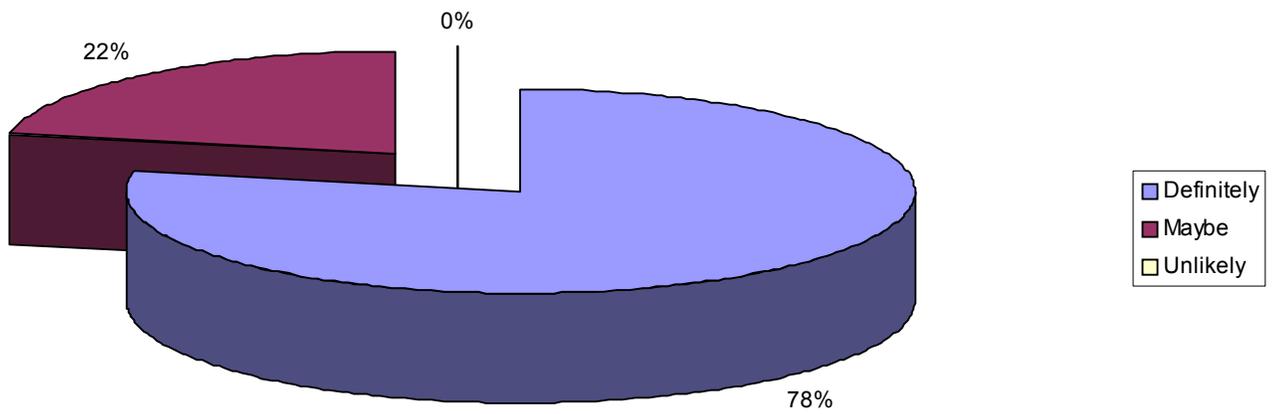


Figure 3
How Could a Lessons Learned System Help You?
Share What you Have Learned with Others

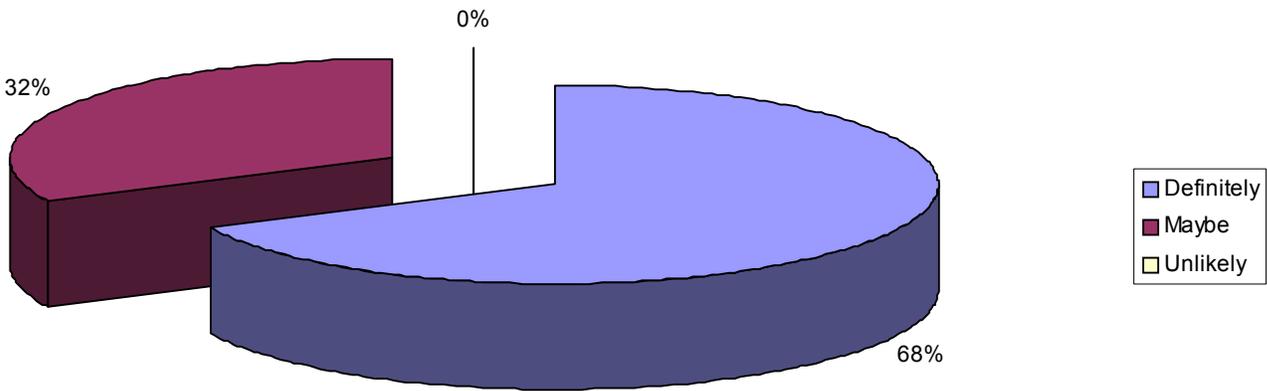


Figure 4
How Could a Lessons Learned System Help You?
Identify People in GSFC with Relevant Skills

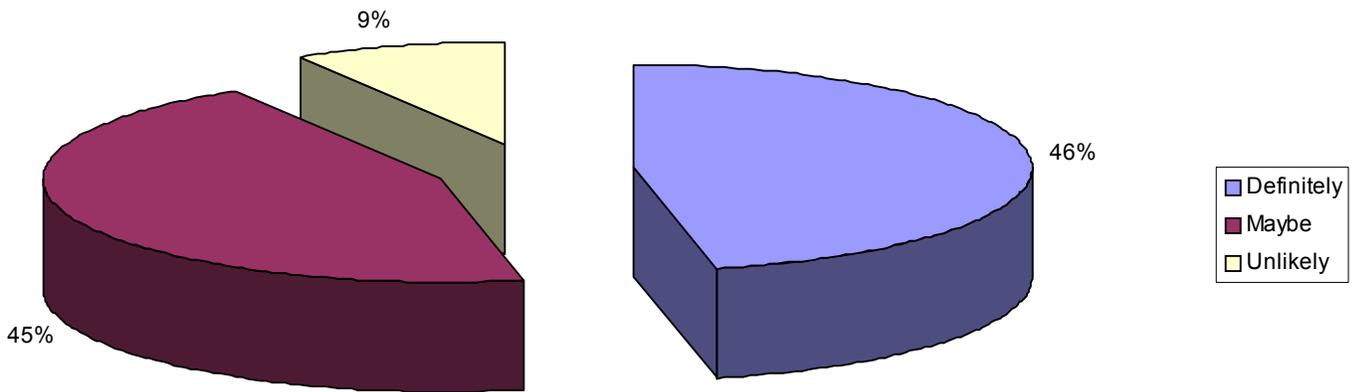


Figure 5
How Would You Prefer to Obtain Lessons Learned?
Search An On-Line Database

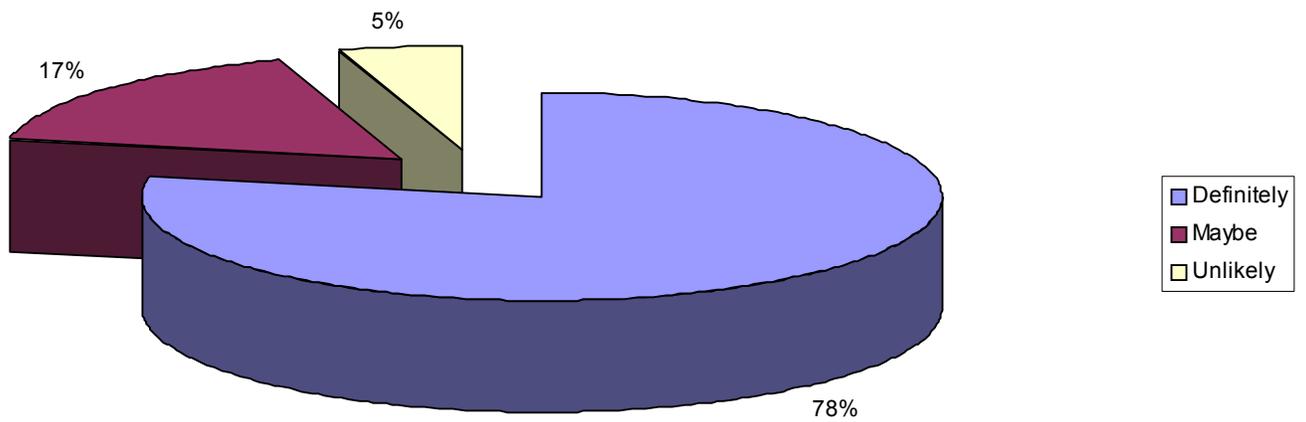


Figure 6
How Would You Prefer to Obtain Lessons Learned?
Have Relevant Information Sent Through Email

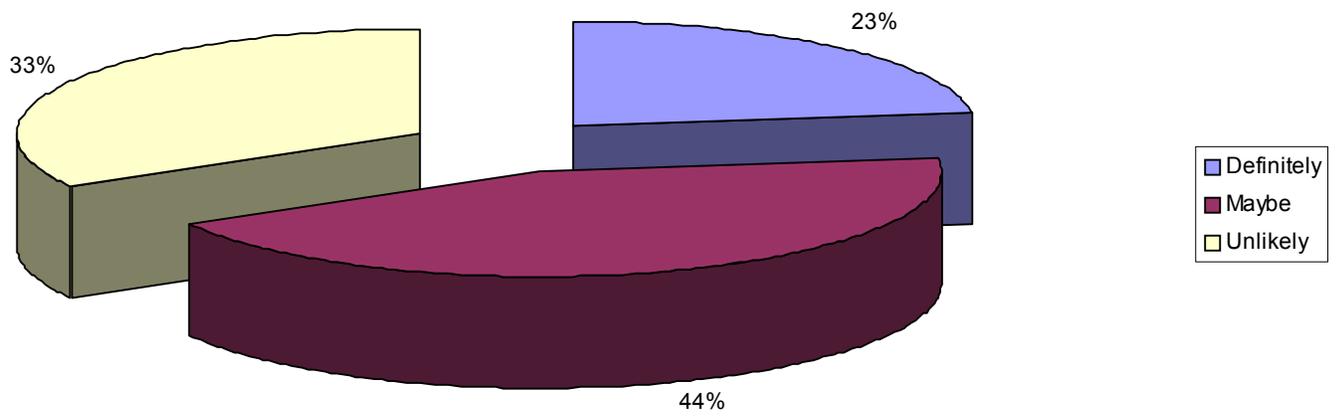


Figure 7
How Would You Prefer to Obtain Lessons Learned?
Through Stories told at Workshops and Brown-Bag Lunches

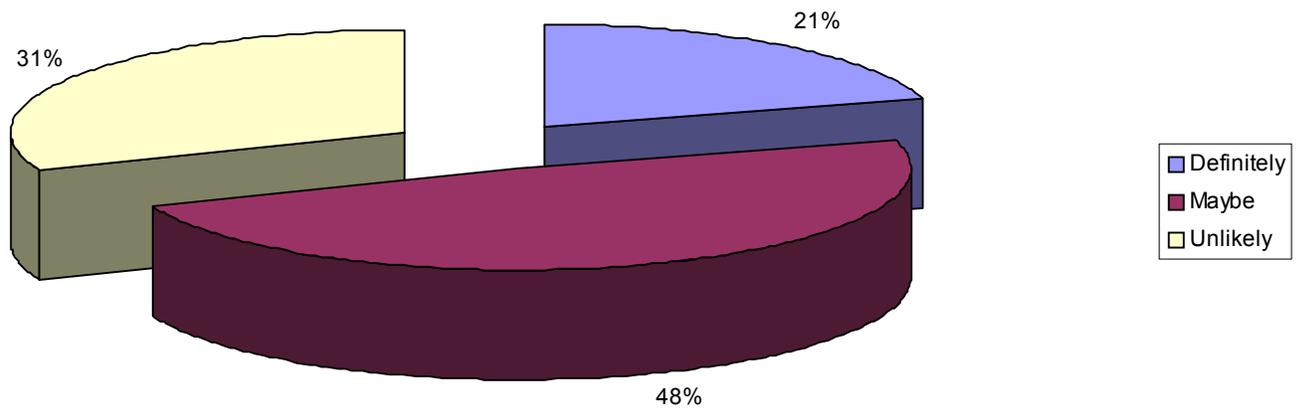


Figure 8
How Would You Prefer to Obtain Lessons Learned?
Availability of Online Video from Workshops and Other Meetings

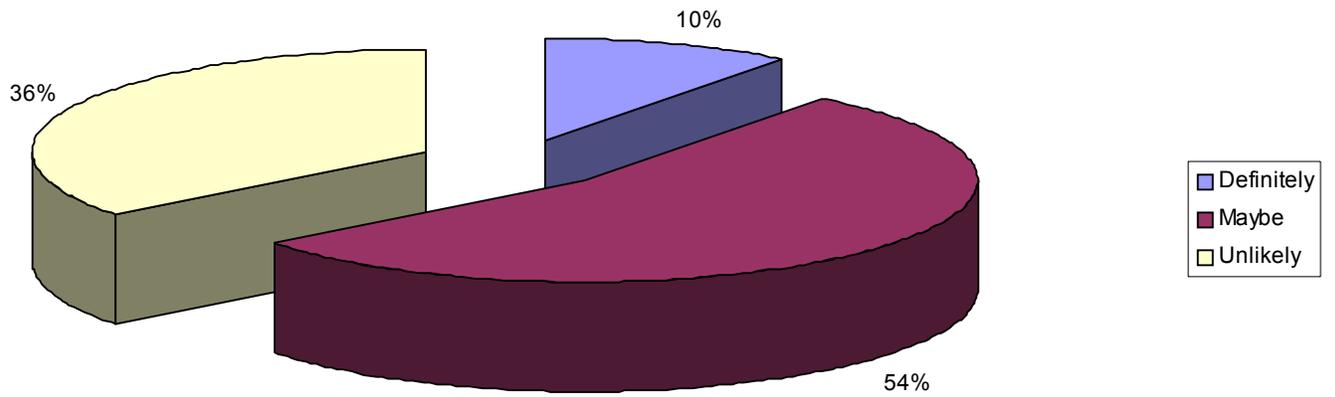


Figure 9
How Would You Prefer to Obtain Lessons Learned?
By Access to Informal Mentors and Retirees

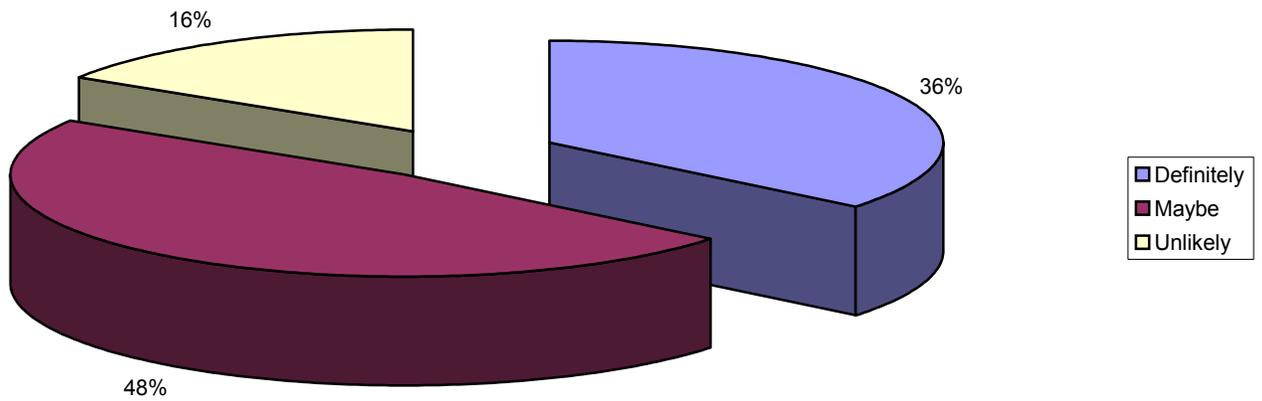


Figure 10
How Would You Prefer to Obtain Lessons Learned?
Via an Online Community Sharing Common Interests

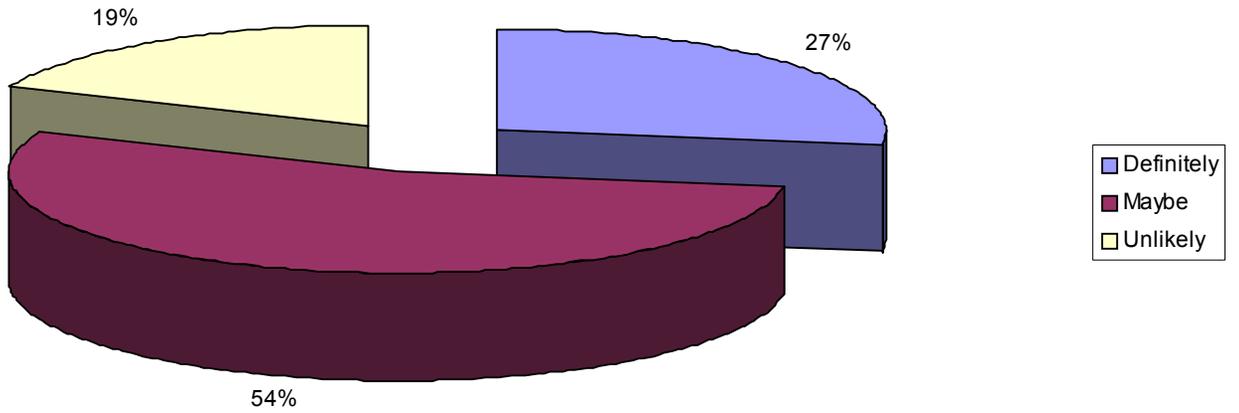


Figure 11
How Would You Prefer to Obtain Lessons Learned?
Using Interoffice Mail

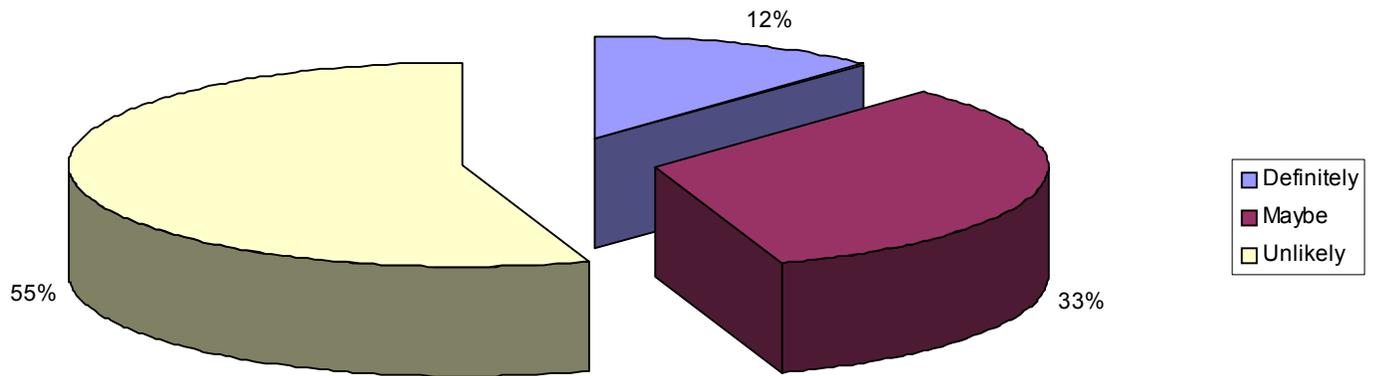


Figure 12
How Would You Prefer to Obtain Lessons Learned?
Having Someone Call

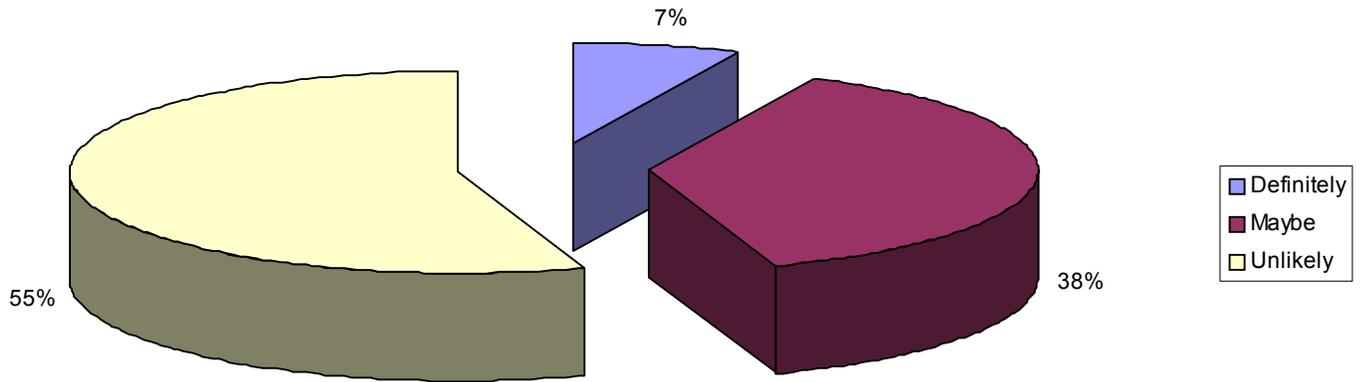


Figure 13
What Type of Lessons Learned Information Would You Find Most Useful?
Specific Lessons Learned Occurrence Report

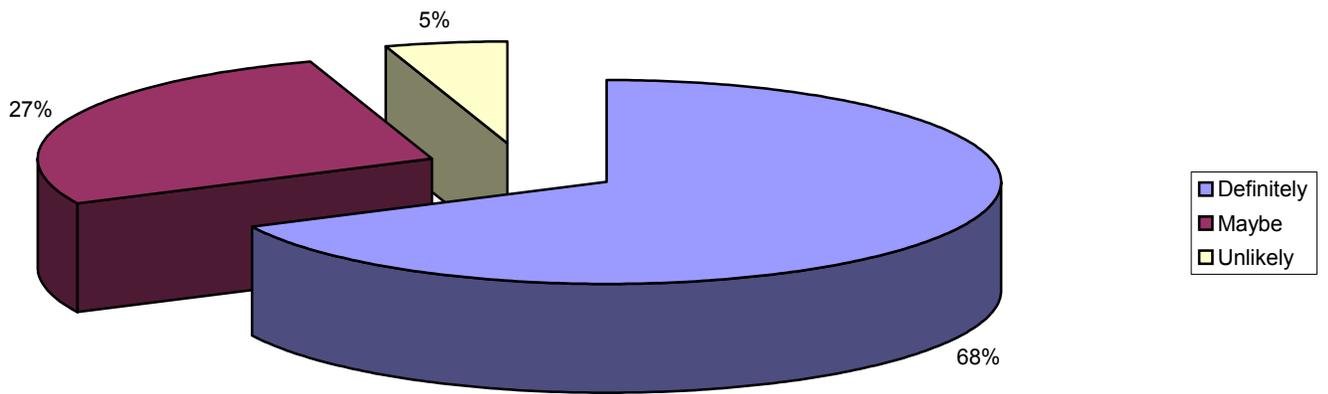


Figure 14
What Type of Lessons Learned Information Would You Find Most Useful?
Project-Specific Reports; After-Action, Independent Review Team, etc.

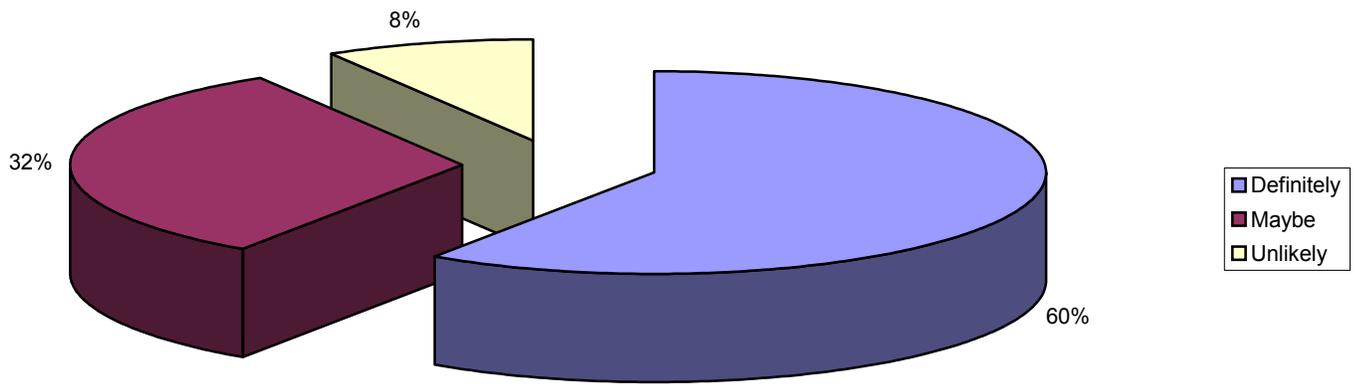


Figure 15
What Type of Lessons Learned Information Would You Find Most Useful?
Compendium of Common Threads

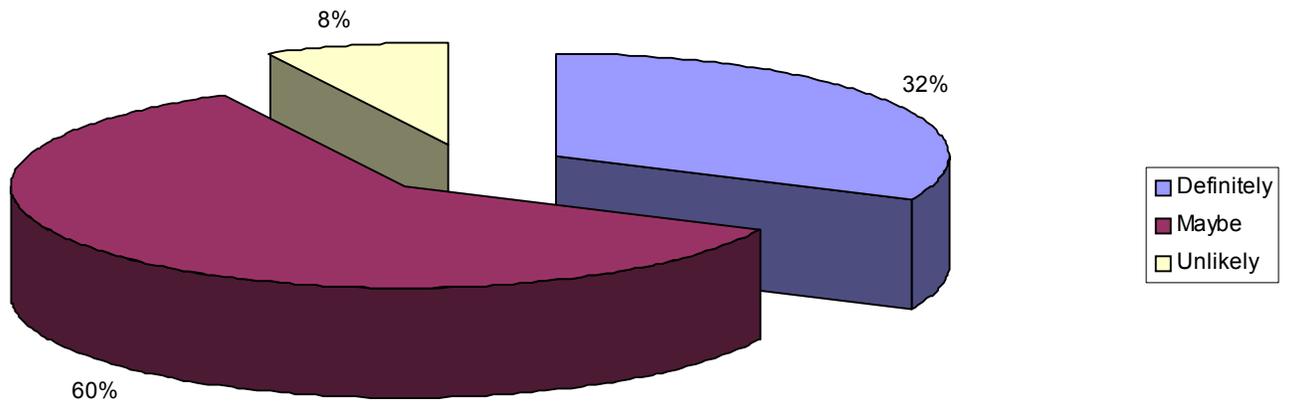


Figure 16
What Type of Lessons Learned Information Woud You Find Most Useful?
Sharing Personal Experience

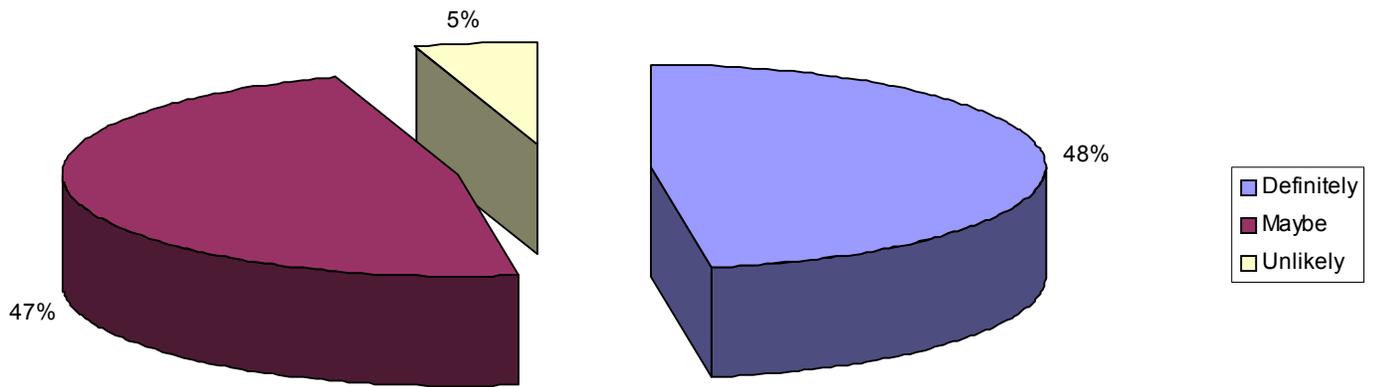


Figure 17
What Additional Sources of Information Would be Useful to You?
Documentation on Current and Previous Projects

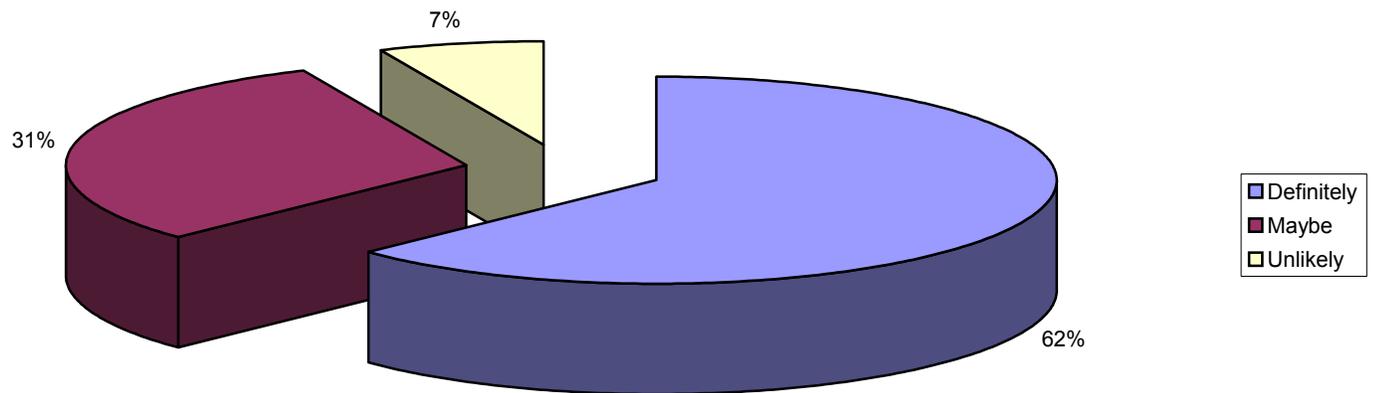


Figure 18
What Additional Sources of Information Would be Useful to You?
Ability to Identify Who in GSFC has Specific Skills

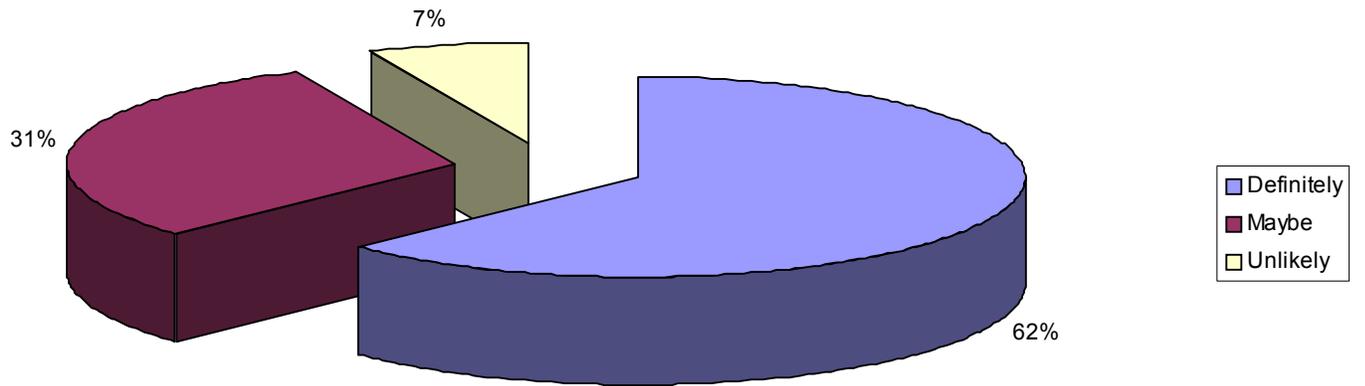


Figure 19
What Additional Sources of Information Would be Useful to You?
News Related to Project Activities

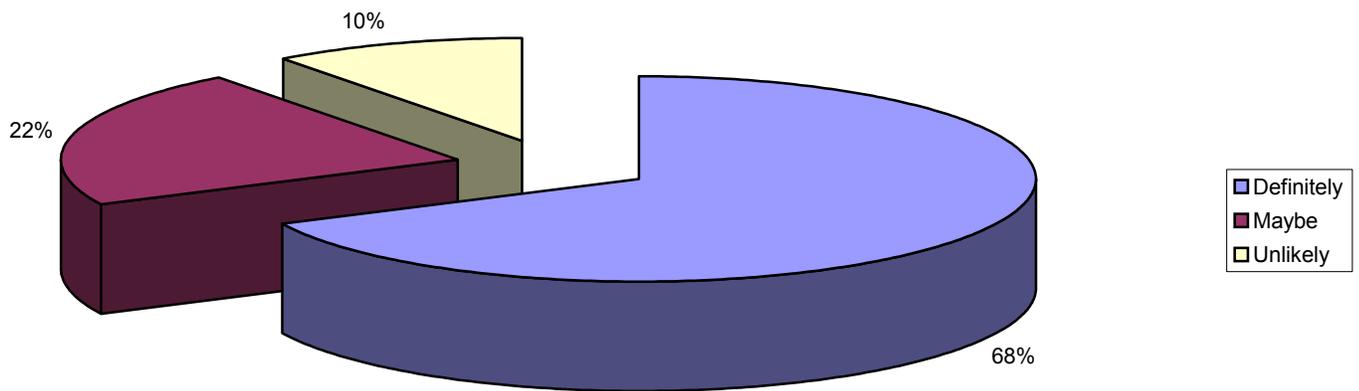


Figure 20
What Additional Sources of Information Would be Useful to You?
Project/Center Library and CM System References

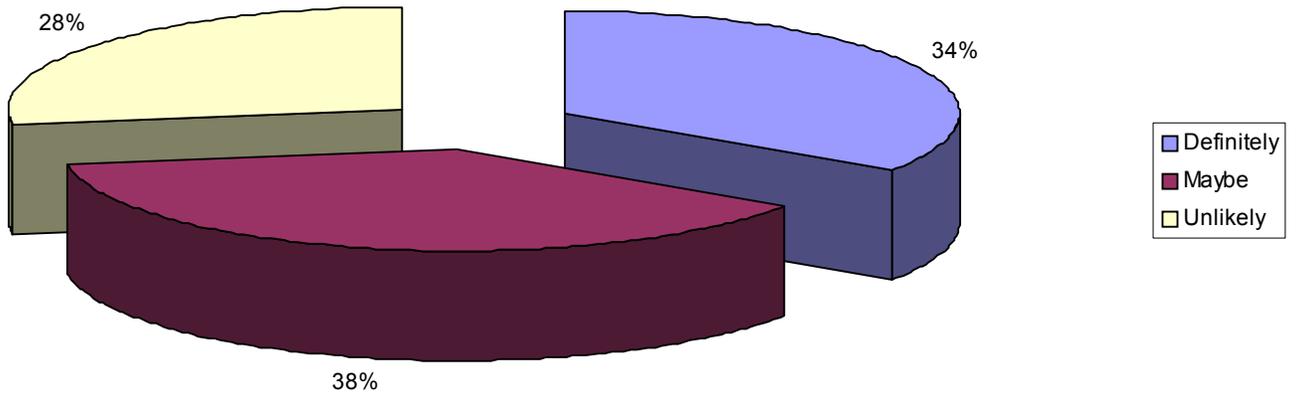


Figure 21
What would Encourage You to Contribute to and Use a Lessons Learned Process?
Opportunity to Improve Job Performance

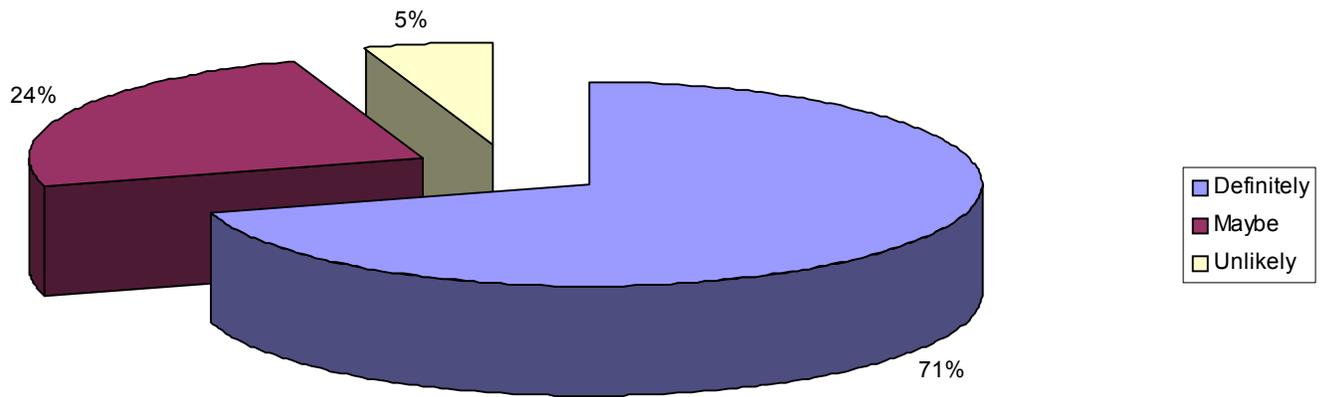


Figure 22
What would Encourage You to Contribute to and Use a Lessons Learned Process?
Peer Recognition of the Value in Sharing Lessons

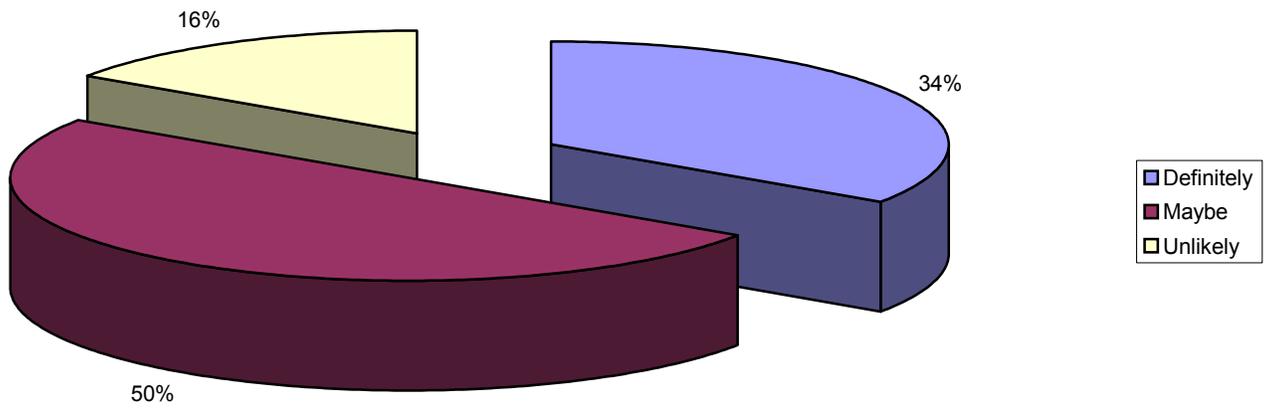


Figure 23
What would Encourage You to Contribute to and Use a Lessons Learned Process?
Incorporation as Part of the Annual Review Process

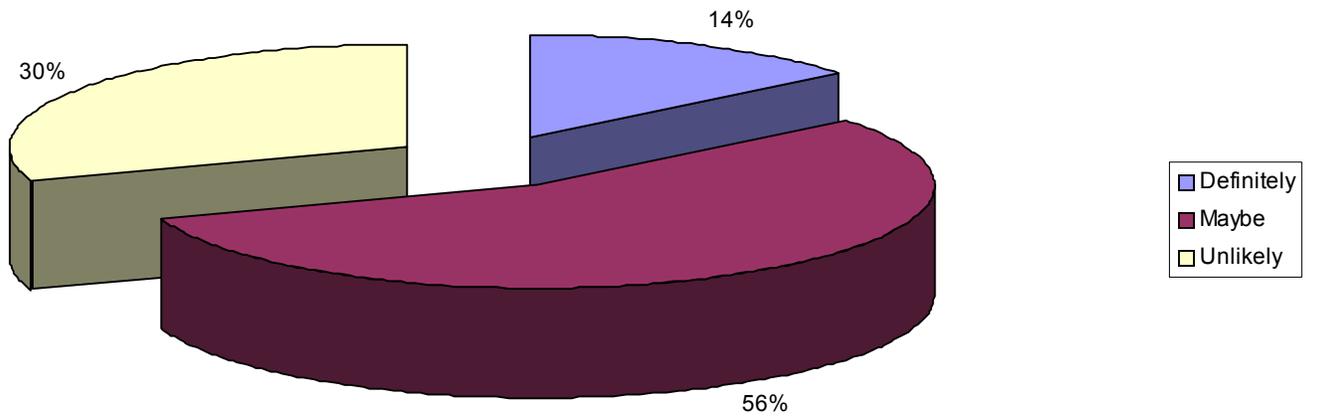


Figure 24
What would Encourage You to Contribute to and Use a Lessons Learned Process?
Cash Bonus Where Tangible Benefits can be Demonstrated

