Federal Aviation Administration

Development and Utility of the Front Line Manager's Quick Reference Guide

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14. ABSTRACT

Air traffic control Front Line Manager's (FLMs) influence the prevention of operational incidents (OIs) and runway incursions (RIs) through practices that enable safe controller performance and mitigate problems related to specific contributing factors, including controller coordination, controller-pilot communication, and controller memory. Proximity and frequent interactions with controllers in the operational environment place FLMs in a unique position to impact air traffic safety through managing controller performance and by mitigating OIs and RIs as common contributing factors. With this understanding of the FLM role, the Human Factors Division (ANG-C1), Booz Allen Hamilton (contractor), and Air Traffic Organization (ATO) developed the Front Line Managers Quick Reference Guide (QRG).The Civil Aerospace Medical Institute (CAMI) subsequently helped the ATO with the reorganization of materials. The guide was intended to provide a management best practices format specific to air traffic control to assist FLMs perform their job. To determine the utility of the QRG, CAMI and ATO developed and administered a survey of FLMs. The survey also provided the ATO with a basis for additions or deletions to the QRG as it related to the specific factors that contribute to OIs and RIs. This report documents the development, implementation, and subsequent survey of the QRG for front line managers. The survey was designed for use by all field FLMs. Suggestions and recommendations from survey respondents are provided, which can keep the guide both current and relevant.

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16. Abstract

Air traffic control Front Line Manager's (FLMs) influence the prevention of operational incidents (OIs) and runway incursions (RIs) through practices that enable safe controller performance and mitigate problems related to specific contributing factors, including controller coordination, controller-pilot communication, and controller memory. Proximity and frequent interactions with controllers in the operational environment place FLMs in a unique position to impact air traffic safety through managing controller performance and by mitigating OIs and RIs as common contributing factors.

With this understanding of the FLM role, the Human Factors Division (ANG-C1), Booz Allen Hamilton (contractor), and Air Traffic Organization (ATO) developed the Front Line Managers Quick Reference Guide (QRG). The Civil Aerospace Medical Institute (CAMI) subsequently helped the ATO with the reorganization of materials. The guide was intended to provide a management best practices format specific to air traffic control to assist FLMs perform their job.

To determine the utility of the QRG, CAMI and ATO developed and administered a survey of FLMs. The survey also provided the ATO with a basis for additions or deletions to the QRG as it related to the specific factors that contribute to OIs and RIs. This report documents the development, implementation, and subsequent survey of the QRG for front line managers. The survey was designed for use by all field FLMs. Suggestions and recommendations from survey respondents are provided, which can keep the guide both current and relevant.

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Development and Utility of the Front Line Manager's Quick Reference Guide

ACRONYMS

ANG - -- - -- - -- - Human Factors Research and Engineering Division
ARTCC - - -- - -- - Air Route Traffic Control Center
AT - - -- - -- - -- - Air Traffic
ATC - -- - -- - -- - Air Traffic Control
ATO - -- - -- - -- - Air Traffic Organization
ATO-E -- - -- - -- - Air Traffic Organization En Route and Oceanic Services
ATO-S -- - -- - -- - Air Traffic Organization Safety Services
ATO-T -- - -- - -- - Air Traffic Organization Terminal Support Services
ATSAP -- - -- - -- - Air Traffic Safety Action Program
BAH - -- - -- - -- - Booz Allen Hamilton
CAMI -- - -- - -- - Civil Aerospace Medical Institute
CIC - -- - -- - -- - Controller in Charge
CPC - -- - -- - -- - Certified Professional Controller
CRM -- - -- - -- - Crew Resource Management
FAA - -- - -- - -- - Federal Aviation Administration
FEA - -- - -- - -- - Front End Analysis
FLM(s) -- - -- - -- - Front Line Manager(s)
OHP - -- - -- - -- - Optimizing Human Performance
OI   - -- - -- - -- - Operational Incident
QRG -- - -- - -- - Quick Reference Guide
RI -- - -- - -- - -- - Runway Incursion
SME -- - -- - -- - Subject Matter Expert
SUPCOM -- - -- - Air Traffic Supervisor's Committee
TRACON -- - -- - Terminal Radar Approach Control

DEVELOPMENT AND UTILITY OF THE FRONT LINE MANAGER'S QUICK REFERENCE GUIDE

INTRODUCTION

Air traffic control (ATC) Front Line Managers (FLMs) are instrumental in meeting Federal Aviation Administration (FAA) Flight Plan objectives for mitigating Operational Incidents (OIs) and Runway Incursions (RIs) by providing leadership to ensure that air traffic controllers' performance meets FAA goals for improving the safety of the National Airspace System (NAS). FLMs also influence the prevention of errors by enabling exemplary controller performance (Greene, 2010).

Information to assist air traffic control FLMs in the performance of their technical duties may not be readily available, and formal training may be delayed due to a number of factors such as access to organizational training or operational mentorship. Providing FLMs with information that helps them supervise controllers may impact the overall safety of air traffic operations. The Quick Reference Guide (QRG) was designed as a resource to help ATC FLMs supervise their employees more effectively by promoting safety, enhancing communication, and encouraging respect in a way that enhances controller performance. The QRG is available to the FLMs online at:

https://employees.faa.gov/org/linebusiness/ato/operations/media/Front_Line_Manager_Quick_Reference_Guide.pdf

It is also available in hard copy in FAA field offices.

Air Traffic Control Front Line Managers

ATC FLMs provide first-line supervision to teams of developmental controllers and certified professional controllers (CPCs). FLMs are responsible for planning and assigning work priorities, evaluating and recommending performance ratings, and listening to and resolving complaints of controllers under their supervision. FLMs are also responsible for identifying and arranging for the training needs of their staff as well as recommending goals and objectives and the means to track these accomplishments. They also participate in the labor-management process and foster an equitable working environment. FLMs must be excellent communicators and be able to adjust quickly to a changing work environment. FLMs use a combination of these skills in supervising controllers. These skills are also intended to mitigate OIs and RIs (International Civil Aviation Organization, 2005).

The Air Traffic Organization (ATO) supported a survey to evaluate the QRG's efficacy. This report describes the development of the Air Traffic Control Front Line Managers Quick Reference Guide and summarizes the findings of the survey designed by the Civil Aerospace Medical Institute (CAMI) to examine the operational functionality of the QRG.

Development of the Front Line Manager Quick Reference Guide

Booz Allen Hamilton (BAH) conducted studies sponsored by the FAA's Human Factors Division and Engineering Division (ANG-C1) and the ATO Offices of Safety (ATO-S), En Route and Oceanic (ATO-E), and Terminal Support (ATO-T) services to identify best practices of FLMs for promoting safety and, therefore, increase the likelihood of reducing the occurrence of OIs and RIs throughout the National Airspace System.

Background research for the QRG was developed in three phases, using different methodology for each group of FLMs: en route, tower, and terminal radar approach control (TRACON). The first FLMs to be assessed were en route, followed by tower, and TRACON.

En route QRG development. The en route QRG background research was conducted and reported in 2006 (Duley, Capriglione, Kalita, Guenther, & Nagy, 2006a). This research focused on general supervisory best practices used by exemplary FLMs in response to a variety of identified problems encountered in the areas of selection and assignment, skills and knowledge, motivation and incentives, and operational environment. BAH used the Optimizing Human Performance (OHP)™ Front End Analysis (FEA) methodology as a human performance model to identify performance with the goal of improvement (Saba Software, 2001). The components of optimal performance were identified as skills and knowledge, motivation and incentive, and operational environment. The FEA approach also allowed for linkage to other systems such as rewards, learning management, and assignment of FLMs. BAH provided certified expertise with this methodology.

Within the FEA framework, BAH reviewed literature related to OIs within the en route environment and collaborated with ATO-E to identify exemplary FLMs and controllers to serve as subject matter experts (SMEs) to provide expertise. Next, BAH conducted working group

Table 1. *QRG Problem Format Example*

Problem Statement:	FLM Challenges:		
Consistent performance management practices are not always utilized	1. Managing performance and conduct of controllers who are not under the watch supervisor's administrative responsibility 2. Knowing the performance history or background of another supervisor's controllers to effectively manage their performance 3. Inconsistently documenting both positive and negative feedback 4. Knowing what constitutes correct performance 5. Relaying performance concerns and praises to the supervisor of record		
	Mitigation Topic: Fostering a Positive Work Culture **Mitigation Topic:** Active Listening	**Mitigation Topic:** Accountability **Mitigation Topic:** Sharing Information	**Mitigation Topic:** Communication

meetings to establish project expectations and develop lists of FLM target job duties and responsibilities. Managers designated as SMEs were then interviewed to validate project expectations with levels of FLM target duties and responsibilities.

Prior to site visits, BAH reviewed relevant FAA documents, OI reports, and other related reports. Site visits were conducted at six Air Route Traffic Control Centers (ARTCCs) for structured FEA interviews with FLMs and reviews of site documentation relevant to safety and best practices. BAH focused on analyzing factors identified as being both barriers to and facilitators of accomplished performance. Consistent with the OHP process, the data collected were organized around the identified components of optimal performance: selection and assignment, skills and knowledge, motivation and incentive, and operational environment. Since both barriers to and facilitators of best practices were reported, patterns in the data permitted further categorization into problem statements that focused on factors facilitating best practices and factors hindering best practices. The SMEs agreed that these workplace problem areas were common to the ATC work environment. With problem areas reported, viable workplace interventions or solutions were also identified and documented for each problem statement.

Identified ATC FLM problem areas with viable solutions became the format for the development of the En Route QRG (Duley, Capriglione, Kalita, Guenther, & Nagy, 2006b). Table 1 illustrates this problem statement format. The QRG was developed to provide precise management focus to the ATC working environment with the intent of preventing and mitigating both OIs and RIs.

Tower QRG development. The 2008 Tower FLM study used the Threat and Error Management methodology to identify best practices to prevent errors and their contributing factors (Capriglione, Williams, Daniels, & Phillips, 2008). The model described the relationship between human performance and error in a conceptual framework. Prior to site visits, BAH reviewed OI and RI data and literature related to OIs and the manager's role. Through site visits to 16 air traffic control towers and through interviews with 30 FLMs, factors influencing supervisor effectiveness in the tower environment were defined. Relevant *coordination*, *communication*, and *memory* best practices were documented.

Specifically, *coordination* focused on controller-to-controller interactions and transfer of information. *Communication* focused on controller-to-pilot exchange of information. *Memory* focused on controller recall of procedures and actions, as well as situational awareness.

Table 2. *QRG Content Example*

Error Identification and Mitigation: *Coordination Error*	**FLM Coordination Error:** 1. Problem Detection 2. Best Practices		
	Mitigation Team Building **Mitigation** Conflict Resolution	**Mitigation** Observation	**Mitigation** Active listening

In addition to identification of controller best practices in these areas, this study identified a three-step process used for applying these practices: 1) problem detection, 2) causal determination, and 3) problem mitigation or elimination response. Table 2 provides a QRG content example for coordination errors.

The tower study identified FLM error management best practices in the tower operational environment; however, much of the information was relevant to all FLMs. While the information provided permitted an expanded best practices format, it also provided the identification of specific problem mitigation topics to be included in the QRG, along with identification and mitigation techniques.

To incorporate this information in the Tower version of the QRG, BAH expanded the ATC supervisory best practices identified by the en route study and added some best practices for tower FLMs identified in the tower study. Specifically, the Problem Statement section was expanded to include tower-relevant situations and mitigating factors, as well as expand the set of best practices applicable to all FLMs.

TRACON QRG development. The third study, which focused on TRACON FLMs, was completed by BAH in 2010 (Hoenicke, Rudolph, & Hill, 2010). The BAH team conducted a Gap Analysis on information collected from the en route and tower studies to identify factors common to TRACON. After identifying common factors of situational awareness, training, compression/complexity, memory, position relief, communication, performance management, staffing, equipment, and motivation and incentives, these common factors were reviewed for the TRACON environment as related to error prevention. In addition, the proportion of developmental controllers supervised and weather were added as factors to be considered in error prevention and mitigation. The TRACON study also identified leadership skills used by effective FLMs, which promoted operational management and administrative effectiveness. This resulted in the addition of a Leadership section, which followed the Problem Statement section in the QRG.

QRG consolidation. BAH research consolidated the content information provided for all three services (en route, tower, and TRACON). The TRACON information was incorporated into the existing QRG draft from the en route and tower studies. The draft document was made available for review. The FAA's Air Traffic Supervisor's Committee (SUPCOM) provided SME review of the document. The original SME research coordinators were retained for continuity. These reviewers worked with ATO-S, ANG-C1, and CAMI to review the BAH draft QRG document. The document was revised to remove some location-specific management situations, making the overall document applicable to managerial conditions across all facility types. Language was carefully reviewed and adjusted to reflect current AT professional use. In addition, sections were included for Crew Resource Management, Safety Culture, Air Traffic Safety Action Program, and Additional References and Resources as supporting documentation.

To summarize, more than 60 En Route, Tower, and TRACON FLMs and their supervisors were interviewed from 30 facilities for the entire project. Research and field interviews focused on the circumstances that contribute to errors and the FLM best practices used to mitigate or prevent them. This made the QRG particularly relevant to the FLM population as a management tool. According to the Executive Summary of the 2006 Supervisory Best Practices for Operational Incident Prevention, "The guide serves as a job-aid that addresses the gap between existing Operational Supervisor training resources that deal with administrative functions but overlook the people skills that are critical for avoiding operational incidents" (Duley et al., 2006a, p. vi).

Although the QRG was developed as a standalone reference tool, it was also incorporated into existing training and could be used as a basis for the development of new training specific to air traffic FLMs. This provided for identification and applicability of management skills specific to those needed by air traffic FLMs, with a focus on the reduction

Table 3. *QRG Organization*

AT FLM Quick Reference Guide	FLM Tabbed Topics:	
	1. Problem Statements 2. Leadership 3. Performance Management 4. Communications 5. Mitigating Coordination Error	6. Mitigating Communication Error 7. Mitigating Memory Error 8. Mitigating Complexity Error
	FLM Tabbed Supporting Information Topics:	
	9. Safety Culture 10. Air Traffic Safety Action Program (ATSAP)	11. Crew Resource Management (CRM) 12. Additional References and Resources

and mitigation of errors. Table 3 provides an illustration of the QRG content topics and supporting information.

The FLM QRG was delivered to managers at air traffic control facilities in hard copy and to FLMs electronically in December 2010. In order to assess the impact, ATO supported a survey to evaluate the efficacy of the QRG. This survey was designed to evaluate the utility of the FLM-QRG and determine if additions would be valuable to ATC FLMs and could be considered for updates to the QRG at a later date. The survey was opened electronically in June of 2011 and remained open through July of 2011.

METHOD

Survey

To assess the utility of the QRG in the field, a survey consisting of 22 questions was distributed to all ATC FLMs. The survey was designed to assess FLM perceptions of the QRG, including content organization, usefulness, and appropriateness. The survey also solicited feedback regarding potential content errors, problems with QRG utility, additional content areas that should be addressed, and general suggestions for improvement. In addition to their perception of the QRG, the survey collected demographic information about the participants, including current supervisory status (e.g., current FLM), air traffic option (en route or terminal), terminal facility type (TRACON, tower, tower/TRACON), facility level, and certified professional controller (CPC), controller in charge (CIC), and FLM tenure.

The survey and its administration methodology were submitted to and approved by the CAMI Independent Review Board (IRB). Survey participant confidentiality was assured.

Survey Participants

A list of FAA air traffic supervisory employees was provided by the FAA's Information Technology, Information Delivery and Collaborative Services office. The list (N=3,151) included all supervisory employees within the air traffic control specialist job series who were assigned to a facility responsible for the separation of air traffic. Supervisory personnel at the FAA's Washington Headquarters, Technical Center, and Aeronautical Center were removed from the list, reducing the pool to 2,956 persons. The list was further refined to exclude area managers, operations managers, higher-level senior managers, and nonsupervisory managers, resulting in a sample of 2,130 FLMs. Of those, 11 survey invitations were undeliverable and 1 FLM was removed upon the supervisor's request, leaving a final adjusted sample of 2,118 FLMs.

Invitations to complete the survey were distributed to FLMs' internal FAA electronic mail addresses. Completed surveys were voluntarily submitted online by 849 participants, resulting in a 40.1% overall response rate. Among responders, 58 indicated that they were not FLMs and were excluded from further reporting. The remaining 791 respondents were included in the final reporting and analysis.

Survey Administration

The survey was designed and distributed using Snap Survey© Version 10.21 software. The software enabled dissemination via electronic mail invitations with embedded hyperlinks. An electronic mail message announcing the survey and encouraging participation was distributed to participants' FAA email addresses on June 1, 2011. The announcement included an embedded hyperlink to view and download the FLM QRG.

Invitations to complete the survey were sent via electronic mail on June 15, 2011. To control access to the survey and protect respondent anonymity, a unique hyperlink was embedded in each invitation and all subsequent electronic mail reminders. The hyperlinks enabled the survey software to track survey completions, generate a unique identification number in a database to track submitted surveys, and automatically generate electronic mail reminders to participants who had not submitted a completed survey. Participants without completed surveys were emailed up to four reminders at 14-day intervals. The reminders encouraged participation and included an embedded hyperlink to access the survey. The survey closed on August 1, 2011. Online survey responses were downloaded.

RESULTS

Most participants (564; 71.4%) indicated that they had reviewed the QRG. Of those who had reviewed the QRG, the majority (72.5%) reviewed an electronic copy. Overall FLM perceptions of the QRG were positive. Most FLMs responded that the information contained in the QRG was somewhat or very appropriate to their job (82.8%), and 79.2% felt that it was well organized. Over half of all FLMs indicated that they would 'probably' or 'definitely' use the QRG as a reference tool in the future (60.8%). When split by FLM tenure (6 or fewer years, 7 to 10 years, more than 10 years), lower tenure (60.6%) and higher tenure (70.7%) FLMS were more inclined to use the QRG as a reference tool for their jobs in the future. Overall, 85.6% of FLMs reported that the QRG was somewhat to very useful. Item level results of the survey are presented in Appendix A of this report.

FLMs were asked if they had suggestions for improving the QRG. Sixty-seven (12%) indicated 'yes' and subsequently provided at least one suggestion for improvement. Their verbatim responses were content coded using 21 unique topics codes organized into three major areas related to the QRG — Content, Implementation, and Technology — with a fourth content area for comments not directly related to the QRG. Each topic code was assigned only once to each comment item (items 10-13) for each respondent, with the number of codes assigned varying from one to five codes. A total of 148 codes were assigned to the 67 survey respondents who provided comments and suggestions.

The majority of comments were coded into the QRG Content area (106 codes). Within the QRG Content area, most of the comments indicated that the QRG was too long or contained too much information, while some provided suggestions for additional content areas such as Human Resources Content and Labor Management

Relations Sections. Of the 12% of FLMs who made suggestions for improvements, none noted any content errors in the existing QRG.

The QRG Implementation coding content area (25 codes) contained comments focused primarily on providing the QRG in a condensed pocket version or quick guide, providing hard copies or electronic copies of the guide, and comments about inadequate time or staffing to use the QRG and the need to promote the QRG and train FLMs to use it.

The Technology content area comments recommended simplifying the electronic version using highlighted sections, including electronic links or bookmarks, and enhancing or facilitating download and print options.

CONCLUSION

Survey data indicate that FLMs perceive that the QRG is well organized and contains appropriate information to be a useful reference tool. Both less and more experienced FLMs find the QRG to be helpful, as indicated by reported intended use, with the more experienced FLMs indicating higher intended use. There were also recommendations for improving the utility of the QRG by making it download more quickly and providing enhanced navigation tools. Recommendations for imbedded links to other relevant FAA documents were also suggested.

The QRG was first envisioned as a best practices guide to aid both new and experienced FLMs in dealing with their job responsibilities. Overall, it has served as a training support when other training opportunities may not be readily available. The QRG is available both in hard copy and online and can be kept in each office where FLMs are responsible for aiding controllers in their duties. Organizational support has been documented for the QRG in FLM training and through SUPCOM Workshops, and it has been frequently accessed through the website, with over 1,000 downloads in 2011. Through incorporation into training programs and website access, it has become an integral part of the FLM toolkit to advise controllers on elements of air traffic control.

Individual areas of the QRG may be considered for updates and there are several additional areas recommended for inclusion that would enhance utility. Fatigue risk management is one of these areas recommended for inclusion, as well as sections on human resources and labor management relations. The continued maintenance and utility of this document will depend on a commitment by management and the organizational sponsorship of the QRG.

REFERENCES

Capriglione, C., Williams, K., Daniels, M., & Phillips, J. (2008). *Tower supervisor best practices for operational error prevention.* McLean, VA: Booz Allen Hamilton.

Duley, J., Capriglione, C., Kalita, S., Guenther, L., & Nagy, J. (2006a). *Supervisory best practices for operational error prevention*. McLean, VA: Booz Allen Hamilton.

Duley, J., Capriglione, C., Kalita, S., Guenther, L., & Nagy, J. (2006b). *Air traffic operations supervisor quick reference guide.* McLean, VA: Booz Allen Hamilton.

Greene, C.J. (2010). *Front line manager quick reference guide for improved air traffic safety: a tool for mitigating errors by enhancing management and controller performance.* Presentation to The National Air Traffic SUPCOM Conference. Washington, DC.

Hoenicke, B., Rudolph, F.M., & Hill, B. (2010). *TRACON front line manager best practices for operational error prevention*. McLean, VA: Booz Allen Hamilton.

International Civil Aviation Organization. (2005). *Threat and error management in air traffic control*. Montreal, Canada: ICAONET.

Saba Software Inc. (2001). *Optimizing human performance*. Redwood Shores, CA.

Front Line Manager Quick Reference Guide Survey

2011 Overall Report

Federal Aviation Administration
Civil Aerospace Medical Institute
Aerospace Human Factors Research Division
Oklahoma City, Oklahoma

And

Xyant Technology, Incorporated
Oklahoma City, Oklahoma

Explanation of Report Content

The Federal Aviation Administration's (FAA) Civil Aerospace Medical Institute distributed a survey to Air Traffic Front Line Managers (FLMs) during June and July 2011. The survey was designed to gather information about job requirements, and examine managers' perceptions of the Air Traffic FLM Quick Reference Guide (QRG).

The results of this survey will be used to assist the FAA and the Technical Operations Supervisor's Committee (SUPCOM) in the development of FLM training and reference materials. This report provides the results of the survey.

Example of Report Format

Response Distribution (%)

5. How well organized is the QRG?

	n	**m**	**sd**
2011	564	3.94	0.99

Very disorganized	Somewhat disorganized	Neither	Somewhat organized	Very organized
3.9	5.9	11.0	50.5	28.7
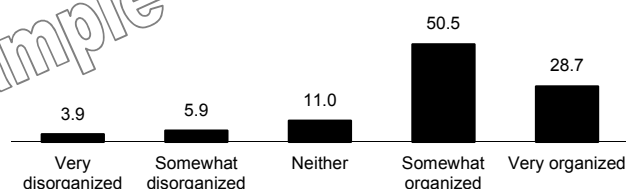
Descriptive Statistics

Number of Respondents (n). The number of people that provided a usable (i.e., valid) response for an item.

Mean (m). The mean is the arithmetic average, or the sum of all scores for an item divided by the number of people who answered that item. Means are reported for items answered on interval scales (e.g., Usefulness). Each response option in the scale is assigned a number from 1 (low) to 5 (high). For example, on the Usefulness scale, the first response option (Not useful) would be assigned a score of 1, and the last response option (Very useful) would be assigned a score of 5.

Standard Deviation (sd). The standard deviation is a measure of dispersion, or spread of scores around the mean. Smaller standard deviation values indicate higher levels of agreement among respondents.

Minimum (Min). The lowest, or minimum, score provided for an item.

Maximum (Max). The highest, or maximum, score provided for an item.

Median (Med). The exact middle data point in a set of rank-ordered scores. It is less affected by extreme scores in comparison to the mean, and thus, is relied upon when extreme scores are present in a data set (e.g., year became a CPC controller, item 17).

Response Distributions (%). Distributions can show where perceptions are negative or positive by looking at the percentage of the respondents choosing low (1 and 2) or high (4 and 5) response options. Items are written so that a response of 4 or 5 is positive.

2011 Front Line Manager Quick Reference Guide Survey

This survey was designed to gather information about job requirements, and to examine Front Line Managers' (FLM) perceptions of the Air Traffic FLM Quick Reference Guide (QRG). Therefore, only those respondents who indicated that they were currently serving in a supervisory capacity at an air traffic facility were included in the final reporting for items 2 through 22.
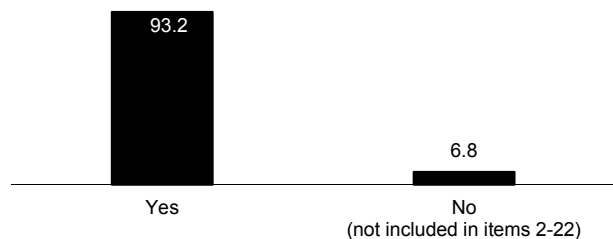
Some items were used to branch or route the respondent to different sections of the survey. These items were required and are denoted following the item text.

Front Line Manager

Response Distribution (%)

1. Are you currently an active Front Line Manager? (Required)

   n

   849

Bar chart for item 1:
- Yes: 93.2
- No (not included in items 2-22): 6.8

The remainder of this report (items 2 through 22) includes only those respondents who indicated that they were an active Front Line Manager ('Yes' on item 1).

2. In prior years, do you recall participating in a study of Front Line Managers to identify best practices for promoting safety and preventing safety incidents?
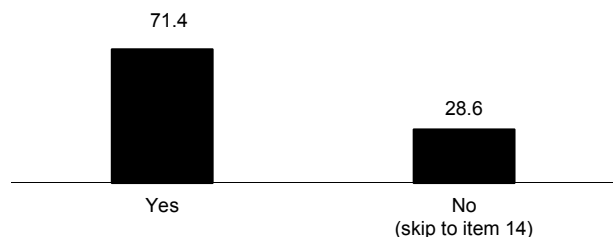
   n

   790

Bar chart for item 2:
- Yes: 30.0
- No: 70.0
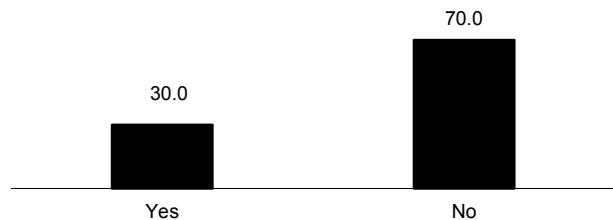
Quick Reference Guide (QRG)

3. Have you reviewed the Front Line Manager Quick Reference Guide (QRG)? (Required)

   n

   791
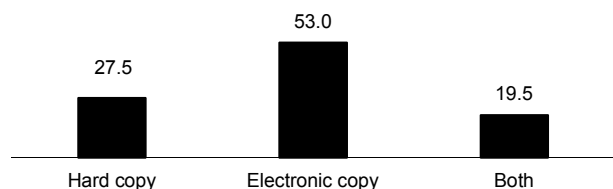
Bar chart for item 3:
- Yes: 71.4
- No (skip to item 14): 28.6

Items 4 through 13 include only those respondents who indicated that they had reviewed the FLM QRG ('Yes' on item 3).
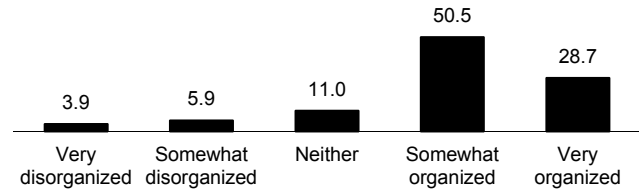
4. Did you review the QRG as:

   n

   564

Bar chart for item 4:
- Hard copy: 27.5
- Electronic copy: 53.0
- Both: 19.5

2011 Front Line Manager Quick Reference Guide Survey

Response Distribution (%)

5. How well organized is the QRG?

n	**m**	**sd**
564	3.94	0.99

- 3.9 Very disorganized
- 5.9 Somewhat disorganized
- 11.0 Neither
- 50.5 Somewhat organized
- 28.7 Very organized

6. How useful is the QRG?

n	**m**	**sd**
563	3.37	1.13

- 3.9 Not useful
- 27.0 Somewhat useful
- 10.5 Neither
- 45.1 Moderately useful
- 13.5 Very useful
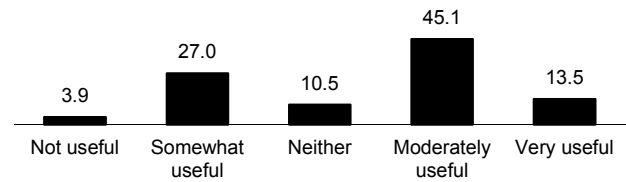
7. How appropriate was the information contained in the ORG to your job?

n	**m**	**sd**
554	4.02	0.93

- 2.4 Very inappropriate
- 6.5
- 8.3 Neither
- 52.7
- 30.1 Very appropriate
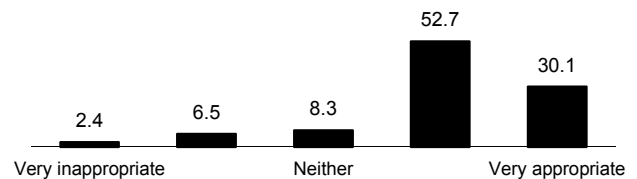
8. Do you think you will use the QRG as a reference tool for your job in the future?

n	**m**	**sd**
554	3.61	1.00

- 1.3 Definitely not
- 16.1 Probably not
- 21.8 Unsure
- 42.4 Probably yes
- 18.4 Definitely yes
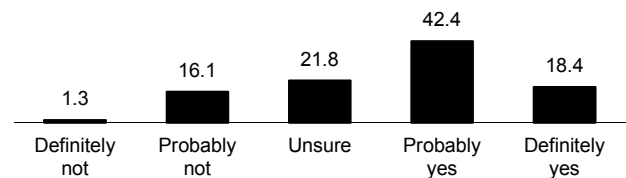
9. Do you have suggestions for improving the QRG? (Required)

n
556

- 12.1 Yes
- 88.0 No (skip to item 14)

A4
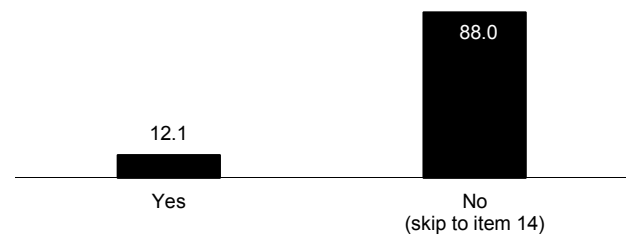
2011 Front Line Manager Quick Reference Guide Survey

Quick Reference Guide (QRG)

Items 10 through 13 include only those respondents who both indicated that they had reviewed the FLM QRG ('Yes' on item 3), and had suggestions for improving the QRG ('Yes' on item 9).

	n
10. Identify additional content areas that need to be addressed in the QRG:	24
11. Identify any potential content errors that you found in the QRG:	8
12. Identify any problems with the organization or utility of the QRG:	15
13. Do you have any other suggestions or comments concerning the QRG?	46

Demographics

Response Distribution (%)

14. At which type of facility are you currently an active Front Line Manager? (Required)

n

782

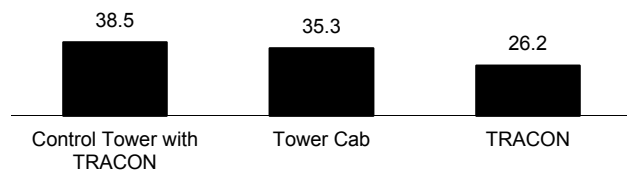| En Route (skip to item 17)	Terminal
43.9	56.1
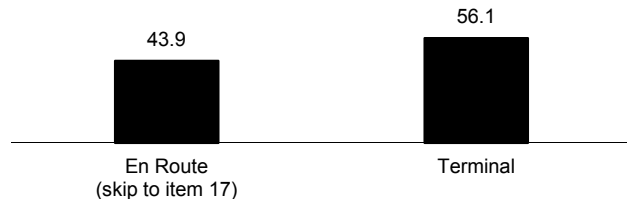
Items 15 and 16 include only those respondents who indicated that they were an FLM at a Terminal facility ('Terminal' on item 14).

15. Facility type:
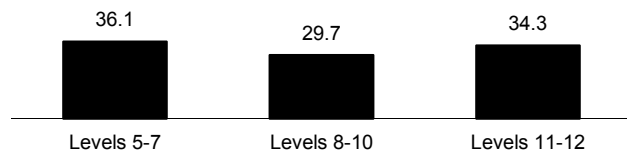
n

439

Control Tower with TRACON	Tower Cab	TRACON
38.5	35.3	26.2

16. Facility level:

n

438

Levels 5-7	Levels 8-10	Levels 11-12
36.1	29.7	34.3

17. In what year did you become a CPC controller?

n	**min**	**med**	**max**
771	1969	1992	2011

Demographics

Response Distribution (%)

18. Were you a CIC? (Required)

n

782

88.6	
Yes	No (skip to item 20) 11.4
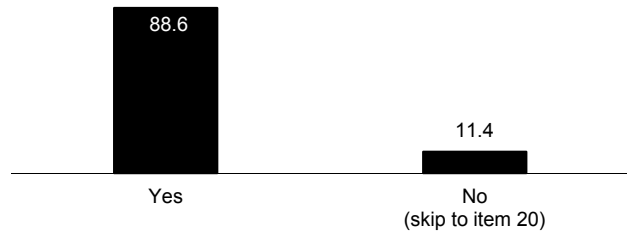
Item 19 includes only those respondents who indicated they were a CIC ('Yes' on item 18).
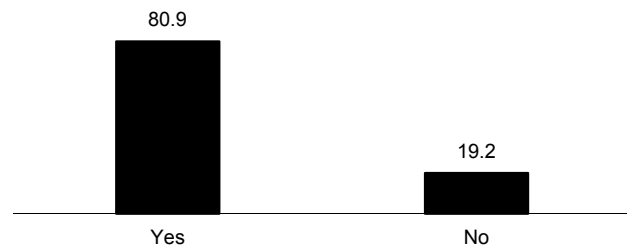
19. In what year did you become a CIC?

n	**min**	**med**	**max**
661	1973	1995	2010

20. In what year did you become a Front Line Manager?

n	**min**	**med**	**max**
769	1986	2007	2011

21. Have you received a performance award?

n

773

80.9	19.2
Yes	No

22. Has your facility received a performance award?

n

759

60.2	39.8
Yes	No