Perceptions of a Flight Operations Quality Assurance Programs in a Collegiate Environment

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The use of Flight Operations Quality Assurance (FOQA) programs has become more feasible for flight training in small single-engine aircraft. What has still to be determined is the total impact on pilot training quality through the utilization of digital data recording systems. With the introduction of FOQA, the standard instructor now has the capability to determine flight skills and abilities through digital data collection, and the effects on pilots’ perceptions needs to be identified. It is suspected that pilot’s awareness of FOQA data collection occurring during flight will have a similar effect on their performance. Survey analysis of student perceptions of the FOQA implementation process and the knowledge of the purpose and functionality of FOQA programs within the aviation industry. Surveys will be administered to students and instructors in the flight training program of a Part 61 training school.

The concept of a Flight Operations Quality Assurance (FOQA) program has roots in previous quantitative and qualitative aviation recording programs such as flight data recorders (FDRs), the Aviation Safety Action Program (ASAP), and the NASA Aviation Safety Reporting System. As indicated by program success at the airline level, a FOQA program must be accompanied by safety management systems (SMS) and a sound safety culture (Wiley 2007; FAA, 2006b). Management must fully support the FOQA program initiatives and strong communication channels through all levels of the flight entity must be in place. Confidentiality and data protection issues remain the largest barrier to FOQA program implementation (FAA, 2004; FSF, 1998) and are also discussed in the FOQA context. Airlines have realized much success from FOQA programs, though no efforts have yet been made to tailor these programs to the unique needs of the university flight training setting. With relative inexperience in the collegiate market lies an increased potential for misperceptions and unique challenges which must be assessed. This paper outlines an initial process for evaluating student-level perceptions of a potential FOQA program under consideration for implementation at a large U.S. university.
Current Aviation Reporting Systems

Information systems intended to promote and encourage safe operations are not a new concept in the aviation industry. Though a few have captured quantitative data, most systems have relied on qualitative pilot reports for such data collection (Wiley, 2007; FAA, 1997). Pilot reports gather subjective information, while information from flight data recorders and quick access recorders provide objective information which provides a different view of events. As aviation has progressed and advanced as a science, reporting methods have as well. Specifically, NASA’s Aviation Safety Reporting System (ASRS) can be identified as influencing FOQA program initiatives in the de-identified, non-punitive reporting styles that are characteristic of each (FSF, 1998).

There are other qualitative reporting systems that are currently operated in the aviation industry. The Aviation Safety Action Program (ASAP) is a qualitative, airline specific pilot-initiated reporting system. Self-reporting systems of this sort are non-punitive and the best way to keep abreast of potential hazards and risks in the operation (Corrie, 1997). Wiley (2007) states that these reports are beneficial in acknowledging the existence of discrepancies, but usually fall short of addressing the real problems at hand, since all information gathered is subjective and biased from pilot recounts of actual flight scenarios. Though information collected from ASRS reports has occasionally assisted operators in finding problems and safety-compromising conditions in the past, there is still a large amount of relevant qualitative safety information that operators miss from events due to this subjective reporting style. A potential conflict arises with the utilization of equipment to feed a FOQA program in that it is no longer voluntary. Data is being recorded at all times the aircraft is being utilized. This dichotomy between voluntary reporting and mandatory data collection has the potential to create negative perceptions of a flight operation.

FOQA Program Development

FOQA is a significantly different program than all previous safety programs discussed. Unlike the ASRS or various FAA Aviation Safety Action Programs (ASAPs), FOQA uses quantitative, objective data from flights to enhance trend monitoring and address operational risk issues (FAA, 2004; FSF, 1998). FOQA programs can lead to the development of advanced training programs such as Advanced Qualification Programs (AQPs). Specifically, FOQA data can accurately verify pilot learning outcomes required by AQPs (FAA, 2006a). Historically the only individuals that knew the true events concerning a given flight were those that were in the actual cockpit. The pilot and sometimes first officer or flight instructor would be the only individuals that could recount the events of the entire flight. With FOQA data and the ability to verify the pilot’s aircraft manipulation ability there is a new input that many industry and educational professionals don’t know how to effectively utilize.

The first workshop attempting to identify the benefits, utilization, and to encourage adoption worldwide of FOQA programs was by the Flight Safety Foundation (FSF) in Taiwan in 1989 (FSF, 1998). According to the Foundation (1998), their blueprint for FOQA has been the backbone for FOQA progress in the United States, though there is much more work to be done. The FAA took initiative to development a formal FOQA program in 1990 by hosting a FSF workshop in Washington, DC, and in 2001 developed a rulemaking committee to further work in this area (FAA, 2003; FSF, 1998).

Before FOQA received full support from the FAA, a demonstration project was carried out to assess the costs, benefits, and safety enhancement associated with the program (FSF, 1998). During this project, the FAA provided hardware and software to four airlines which agreed to implement FOQA programs and share data with the FAA. As a result of the project, the FAA determined that FOQA programs would be made voluntary, as data collection and use for advanced FOQA programs were still in primitive form. The project demonstrated that the FOQA concept was a success for airlines by allowing enhanced trend monitoring and the identification of operational risks (FSF, 1998). The FAA did not attempt to create a
FOQA program for non-commercial use during their three year demonstration project (FSF, 1998), though a FOQA program for the general aviation sector, including collegiate flight operations, would improve safety and operational performance and assist in the training of new pilots (Mitchell, Sholy, & Stolzer, 2007).

An airline FOQA program development guideline is available in Advisory Circular 120-82, which discusses the benefits, set up, and maintenance of such a program (FAA, 2004). This document also provides a template for the Implementation and Operations (I & O) plan set-up as well as key definitions that must be addressed during program establishment (FAA, 2004). In order to be fully operational in a university flight school setting, a FOQA program must fit into the safety program goals and be supported by the university flight department. A safety culture must exist if additional programs, such as FOQA, are to be successful (Wiley, 2007).

Before a FOQA program or further safety management system can be launched at a university flight school, it must be determined if the cultural environment is in place to support it (Wiley, 2007). The FAA (2006b) states that, “the principles that make up the [Safety Management System] functions will not achieve their goals unless the people that make up that organization function together in a manner that promotes safe operation” (p. 4). This organizational aspect is termed a safety culture (Block, Sabin, & Patankar, 2007; FAA, 2006b; Wiley, 2007). A safety culture is composed of psychological, behavioral, and organizational elements (FAA, 2006b). Organizational elements are ones that management has the most control over, and it has been discovered that if this element does not exist and thrive, a safety culture will likely fail (Wood, Dannatt, & Marshall, 2006).

An important aid to the development and sustainability of a safety culture is to hold regular safety meetings with personnel from a wide range of departments and levels (Wood et al., 2006). Wood et al. explains the goal of such meetings is to share information, highlight and discuss any known threats, and make sure that all personnel have the same perspective on the threats. This assists in developing the feeling of safety within operations being a shared responsibility within the company (Wood et al., 2006).

Airline officials, pilot union representatives and the FAA recognized that data protection issues were the biggest roadblock for FOQA program implementation (FSF, 1998). Initially, pilot unions were reluctant to sign FOQA agreements with airlines as they feared a lack of protection for collected FOQA data. FSF (1998) highlights three concerns airline pilot unions had with program implementation:

“[first,] that the information may be used in enforcement/discipline actions; [second,] that such data in the possession of the federal government may be obtained by the public and the media through the provisions of FOIA; and [third] that the information may be obtained in civil litigation through the discovery process” (FSF, 1998, p. 7).

To address these concerns, 14 CFR Part 13 Section 13.401 was created. This document mandates FOQA data be stripped of any information that may identify the submitting airline before the data is passed to the FAA (FAA, 2004). The FAA ensures that “aggregate data that is provided to the FAA will be kept confidential and the identity of reporting pilots or airlines will remain anonymous as allowed by law” (FAA, 2004, p. 1). It is believed that relatively little exposure or experience with FOQA programs in any context will directly impact the perceptions of the individual within the flight program utilizing FOQA.

The possibilities FOQA programs offer are too beneficial to be ignored by university flight school operations. However, the process of adapting FOQA programs to university flight needs proves daunting and cumbersome for traditional operators. Guidance from previous systems may assist with collegiate FOQA development, but attention must be paid to the legalities of data collection which relate to collection of student data. With support from management and a solid safety culture in place, a data collection system can be developed and standardized. Hopefully, university flight schools would provide
similar benefits that airlines have realized from FOQA programs while at the same time preventing a culture of fear or retribution from being developed either in reality or in perception. It is this issue that the survey that was developed and delivered attempted to identify.

**Student Perceptions Survey**

The authors developed a web-based survey to assess the perceptions of flight instructors and students in the flight program at a large Midwestern university. The survey was designed to determine the current and proposed methods of upset recovery training in each flight program and to use the results to foster dialogue between institutions to determine the most effective method of upset recovery training. The online survey was conducted during the first quarter of 2011. The authors were able to obtain survey information from 67 of the 208 potential respondents for a 32.2% response rate.

Respondents were primarily individuals that have been pilots from between 1-4 years (59%) and 27% having been pilots for more than 4 years. The amount of flight time of the participants was almost split evenly between less than 200 flight hours (49%) and more than 200 hours (51%) with the highest level of respondents being above 300 hours (36%).

The survey was broken down into three distinct areas. The first section attempted to discover the perceptions of the respondents in regards to the current policies and procedures of the University’s flight program. The second section attempted to discover the knowledge level and depth of understanding that the respondents had of FOQA programs both in collegiate aviation and in the aviation industry. The final section attempted to determine the perceptions of the respondents in regards to the existence of an ongoing FOQA implementation within the academic program.

<table>
<thead>
<tr>
<th>Statement Wording</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
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<tbody>
<tr>
<td>The University's Flight Operation policies and procedures make sense to me</td>
<td>3.77</td>
<td>0.97</td>
</tr>
<tr>
<td>The University's Flight Operation policies and procedures are too strict</td>
<td>3.28</td>
<td>1.13</td>
</tr>
<tr>
<td>The University's Flight Operation policies and procedures are based upon legitimate safety concerns</td>
<td>4.22</td>
<td>0.93</td>
</tr>
<tr>
<td>I feel secure about my flight performance at the University</td>
<td>4.58</td>
<td>0.68</td>
</tr>
<tr>
<td>The Flight Department has a code of professional conduct that Students and Instructors are expected to follow</td>
<td>4.22</td>
<td>1.07</td>
</tr>
<tr>
<td>I am knowledgeable about FOQA programs at the airlines/aviation industry</td>
<td>2.55</td>
<td>0.94</td>
</tr>
<tr>
<td>I am knowledgeable about FOQA programs in collegiate aviation</td>
<td>2.94</td>
<td>0.83</td>
</tr>
<tr>
<td>I am knowledgeable about the University’s Implementation of a FOQA program</td>
<td>2.66</td>
<td>1.02</td>
</tr>
</tbody>
</table>
### Perceptions of FOQA Program Implementation

5-Point Likert Scale  
Strongly Disagree - 1  
Strongly Agree - 5

<table>
<thead>
<tr>
<th>Statement Wordings</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
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<tbody>
<tr>
<td>The feedback that I receive about my performance from my flight instructor is sufficient and I do not need digital information from the FOQA program to make improvements</td>
<td>3.57</td>
<td>1.02</td>
</tr>
<tr>
<td>Personal input from flight instructors and students should be utilized more for evaluation than FOQA digital data</td>
<td>4.06</td>
<td>0.95</td>
</tr>
<tr>
<td>Performance information that the FOQA digital data provides is more objective than personal input from flight instructors/students</td>
<td>3.3</td>
<td>1.07</td>
</tr>
<tr>
<td>I see the implementation of FOQA data as a threat to my freedom as a pilot</td>
<td>3.48</td>
<td>1.19</td>
</tr>
<tr>
<td>The Administration at the University believes that Students and Instructors are the most important asset of our flight program</td>
<td>3.21</td>
<td>1.31</td>
</tr>
<tr>
<td>With the implementation of a FOQA program at the University, pilots will be constantly watched to assure that rules and procedures are followed</td>
<td>3.76</td>
<td>1.13</td>
</tr>
<tr>
<td>FOQA programs discourage creativity, innovation, and continuous improvement</td>
<td>3.19</td>
<td>1.16</td>
</tr>
<tr>
<td>With the implementation of FOQA digital data I will become a number/statistic rather than a person/pilot</td>
<td>3.42</td>
<td>1.23</td>
</tr>
<tr>
<td>Overall, when I think about the Flight Operations Quality Assurance Program at the University, I feel...</td>
<td>3.03</td>
<td>1.03</td>
</tr>
</tbody>
</table>

### Conclusion

It is possible that the knowledge of FOQA programs in general played a part in the low response rate to the survey. Despite this level of response some initial conclusions can be drawn. As the program becomes more mature additional data will be taken to assess the change in perceptions over time and as more comfort is developed with the system. Trust in a new and unknown system must occur over a period of time and it is not surprising that these results show the same conclusion.

In general the students and instructors believe that the policies and procedures at the university are based upon reasonable safety concerns and that a code of professional conduct is required. The students also believe that the rules are too strict to some degree, but are willing to abide by the policies and procedures by virtue of them relating to safety concerns and that they generally make sense to each of the pilots. Overall there was moderate to strong support for the policies and procedures established and a willingness to follow the prescribed requirements established by the flight administration.

In general the students and instructors responded that they were not very knowledgeable with FOQA programs either within collegiate aviation, within the aviation industry, or in regards to the implementation process at the university. There was a kickoff meeting at the end of the 2010 calendar year in which the basic facets of a FOQA program were covered, but since the students and instructors have yet to actually engage with the program and get direct feedback there is a deficit in the knowledge and understanding level at this point.
In general the students and instructors didn’t have strong feelings toward the negative or positive side in regards to their perceptions of the FOQA program implementation. There was a sense of being unsure as to what it would do and how it would be used and a concern that too much emphasis would be placed on the aspect of data utilization. The students and instructors are well versed in the way feedback is accomplished currently in a very personal and individual manner. All respondents felt that that current system of feedback is sufficient and that the implementation of a data collection system wasn’t necessary. Much like the airlines, pilot unions, and FAA had to learn what benefits and drawbacks there was to the implementation of a FOQA program within their own operations, it will be necessary for students and instructors eyes to be opened to the possibilities within the FOQA program.

References


