ESTABLISHING A SUITABLE, RELIABLE AND ICAO & EUREGULATORY, AIR OPS CAT & NCC CONFORM CMS - SMS & ERP SYSTEM FOR GENERAL AVIATION OPERATORS WITHIN THE BUSINESS JET AND BUSINESS TURBOPROP IN THEIR WORLDWIDE OPERATION

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Abstract: This report is presented based on my internship in Air Tasking Service Dortmund GmbH (ATSD) – Global Aviation Service UG (GAS) at Dortmund, Germany. ATSD – GAS is working on project to conduct consulting services at a cooperate business jet (part of General Aviation) or in European Aviation Safety Agency (EASA) classified as Part Non-Commercial with Complex Motor Powered Aircraft (NCC) called IFM Traviation GmbH to develop and established Safety Management System (SMS) by installing and producing a suitable SMS / ERP and Compliance Management System (CMS) Manual. Since 25 August 2016, all Part NCC operators in EASA state members must implement the requirements on EASA rules Air Operations Regulation (EU) No. 965/2012, Annex VI / VII. Operators need to understand the rules and ensure they are compliance by following the requirement for examples, operators must have nominated persons for their leading management positions in place, a tailored and suitable Operation Manual and Management System (Safety & Compliance management System) include its Emergency Response Plan (ERP) in place. IFM Traviation GmbH as a Part NCC holder since 2016, wanted to implement and develop a reliable and company tailored SMS, CMS & amp; ERP in their company. The internship was focused on developing a suitable and reliable SMS, CMS, & ERP system & manual as a guidance to IFM Traviation GmbH for implementing SMS, CMS & ERP in the future of their operation activity by conducting SMS Gap analysis (ICAO Gap Analysis Tools), hazard identification (brain storm method and bow tie analysis), risk assessment, safety and compliance internal audit. The conclusions of this report are that IFM Traviation has written SMS, CMS, & ERP in their operational manual but based on the analysis the operation manual is not comprehensive enough and they have not implemented it. With this output of comprehensive SMS, CMS and ERP manual, it can facilitate the company to implement suitable & reliable SMS, CMS, ERP as expected.

Keyword: General Aviation Operators, Business, Jet Business Turboprop

Introduction

My End of Study Project performs at Air Tasking Service Dortmund (ATSD) GmbH – Global Aviation Service (GAS) GmbH located in Dortmund – Germany. Those two companies have merged since December 2017. Currently they are working on a project to conduct consulting services at a cooperate business jet (part of General Aviation) or in European Aviation Safety Agency (EASA) classified as Part NonCommercial with Complex Motor Powered Aircraft (NCC) called IFM Traviation GmbH to develop Safety Management System (SMS) by installing and producing a suitable SMS /ERP and Compliance Management System (CMS) Manual.

Germany is one of the country that has the most number of General Aviation (GA) companies / traffic in entire Europe as well as flying schools (ATOs), private ownership and corporate business jet based on statistics released by German Civil Aviation Authority/ Luftfahr Bundesamtes (LBA).

Table 1. Number of Aircraft in Germany (Source, LBA – 2017)

Year	Fixed-wing Aeroplanes							Rotorcraft	Motor Gliders	Airships	Balloons	Gliders	Total Aircraft
	Single-Engine		Multi-Engine										
	2,000 kg and Below	2,000 kg-5,700 kg	2,000 kg and Below	2,000 kg-5,700 kg	5,701 kg-14,000 kg	14,001 kg-20,000 kg	Above 20,000 kg						
2010	6,801	153	242	444	228	40	772	811	3,081	4	1,260	7,867	21,703
2011	6,744	155	243	428	236	38	770	773	3,122	3	1,257	7,834	21,603
2012	6,757	150	239	414	217	30	767	774	3,195	5	1,215	7,793	21,546
2013	6,733	155	240	403	199	34	758	769	3,263	3	1,201	7,704	21,462
2014	6,689	149	228	393	207	33	751	745	3,357	3	1,183	7,657	21,395
2015	6,596	147	229	371	191	34	751	757	3,403	3	1,164	7,567	21,213
2016	6,553	160	221	381	211	35	777	733	3,456	3	1,124	7,450	21,104
2017	6,527	174	219	291	219	37	753	729	3,528	3	1,102	7,383	20,965

The data, especially Fixed-wing Aeroplanes above 20,000 kg, includes commercial airliners. Source: German Civil Aviation Authority (Luftfahrt-Bundesamtes / Statistikant, www.lba.de

European Commission DG Mobility and Transport in 2015 also made Statistical Data, Data Analysis and Recommendation on Collection of Data in The Field of General Aviation in Europe Report. The present study focuses on safety, economic and environmental aspects related to GA operations are to identify existing information detained by the various General Aviation (GA) stakeholders, to detect missing statistical data and to provide recommendations regarding future collection of missing data. The statistic showed Germany is the most country which response followed that study.

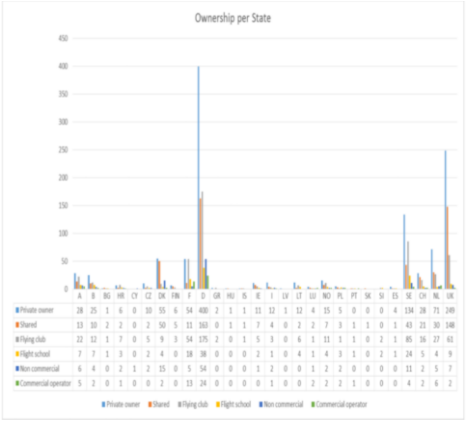

Figure 1. Number of Responses per Ownership (Source, European Commission 2015)

Methodology

On the process of completing the project, Intern collected data and information first and after getting it, the data was analyzed in several ways. Data collection and data analysis are used as outputs in the form of project results and recommendations for IFM Traviation GmbH to be better in the future related to the implementation of Safety and Compliance Management System.

Figure 2. Methodology

Data Collection

Data and information collection is carried out in several ways such as, reviewing documents, Observations to IFM companies and their subcontractors, and conducting interviews with employees or related people of the organization. Details of these activities are:

1. Document Review: Intern got information from Company Operation Manual, EASA Regulation related SMS and Part NCC, ICAO SARP's, and others related document from associations, etc.
2. Observation: Intern was conducting direct observation to IFM Traviation GmbH Company at management and flight section. Intern also conducted observation to Cessna Service Centre Aircraft Maintenance and Cessna CAMO as IFM Traviation GmbH subcontractor.
3. Interview: During observation Intern conducted interview with Management (Accountable Manager), Chief Pilot, Safety/Compliance Manager, Pilot (Captain & First Officer) Helper &Technician.

Figure 3. Flight Section Observation of IFM Traviation Operation

Figure 4 Observation During Pre-Check Prior Departure

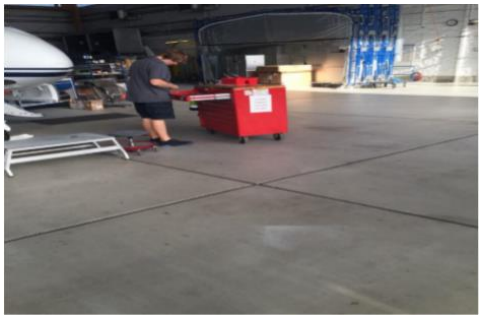

Figure 5 Observation to Cessna Service Centre

Data Analysis

After collecting data and information, then Intern analyzed data with several methods and activities such as conducting SMS Gap analysis, Hazard identification (brainstorming with experts) and bowtie analysis.

ICAO SMS GAP Analysis

Intern conducted ICAO SMS GAP Analysis to know how far or IFM Traviation GmbH as a Part NCC certified operator implement SMS in place and to identified the maturity level of SMS inside the Company.

Based on ICAO Doc. 9859 SMM: A gap analysis compares the service provider's existing safety management processes and procedures with requirements contained in the SMS framework. Aviation service providers will have typically implemented various SMS functions due to their compliance with national regulations or adoption of industry best practices. The development of an SMS should build upon existing organizational structures and control systems. The gap analysis facilitates development of an SMS implementation plan by identifying the gaps that must be addressed to fully implement an SMS. Once the gap analysis has been completed and fully documented, the resources and processes that have been identified as missing or inadequate will form the basis of the SMS implementation plan.

Hazard Identification

After conducting interviews and observations on companies and stakeholders such as AMO/MRO and CAMO, Intern carried out hazards by making list of possible hazards in the company's operational activities. The technique is a brainstorm with experts in the company.

The objective of hazard identification is to identify those hazards which either currently exist and can cause an immediate problem or may pose potential hazards in the future. A hazard can be considered a latent error or threat that has some level of risk associated with it.

A hazard is generically defined as a condition or an object with the potential to cause death, injuries to personnel, damage to equipment or structures, loss of material, or reduction of the ability to perform a prescribed function.

Hazard identification is also based on a combination of reactive, proactive and predictive methods of safety data collection.

1. Reactive. Hazards are identified through investigation of safety occurrences. Incidents and accidents are clear indicators of system deficiencies and therefore can be used to determine the hazards that either contributed to the event or are latent. E.g. Incident report, accident report.
2. Proactive. This methodology involves analysis of existing or real-time situations, which is the primary job of the safety assurance function with its audits, evaluations, employee reporting, and associated analysis and assessment processes. This involves actively seeking hazards in the existing processes. E.g. Surveys, audits, voluntary report
3. Predictive. This methodology involves data gathering in order to identify possible negative future outcomes or events, analyzing system processes and the environment to identify potential future hazards and initiating mitigating actions. E.g. FDA, direct observation

BOWTIE Method Analysis

The Bowtie method is a risk evaluation method that can be used to analyse and demonstrate causal relationships in high risk scenarios. A Diagrammatic illustration of the hazard, the undesirable event, the trigger events/threats and potential outcomes, and the risk controls put in place to minimize the risk. This Method is an excellent way of visualizing risk management and communicating the context of the controls (barriers and mitigations) put in place to manage risks.

The method for building a bow-tie involves asking a structured set of questions in a logical sequence. The completed Bow-Tie illustrates the hazard, the undesirable event, the safety events and potential outcomes, and the risk controls put in place to minimize the risk.

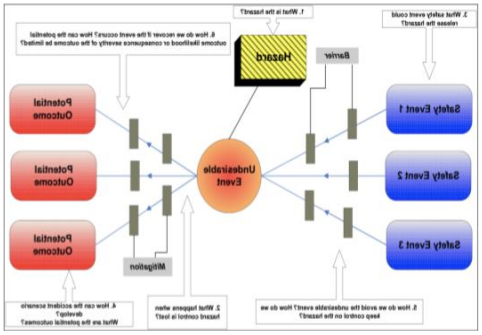

Figure. 6 'Bow-Tie' Diagram illustrating definition of terms (Source, ECAST/ESSI)

Gap Analysis

Intern conducted SMS Gap Analysis based on ICAO Document 9859 SMM to the IFM Traviation GmbH Part NCC Approved by LBA, with the result are:

Table 2 IFM GAP Analysis Result

ICAO SMS FRAMEWORKS	CURENT SITUATION	GAP/REMARKS
1. Safety Policy & objectives		
a. Management commitment and responsibility	• The Company has a Safety Policy laid down in Operation Manual; • Accountable Manager is responsible for allocating resources to implement SMS; • Company clearly indicate which types of behaviors are unacceptable related to the service provider's aviation activities and include the circumstances under which disciplinary action would not apply; • Company has a procedure to making report.	• Safety policy is not signed by the accountable executive of the organization; • Not communicated, with visible endorsement, throughout the organization; • Not periodically reviewed of safety policy and objectives to ensure it remains relevant and appropriate to the service provider

Table 2 IFM GAP Analysis Result … (Continued)

ICAO SMS FRAMEWORKS	CURENT SITUATION	GAP/REMARKS
1. Safety Policy & objectives		
b. Safety accountabilities	• Company identified an accountable executive who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the company, for the implementation and maintenance of the SMS; the accountable executive has full control of the financial and human resources required for the operations authorized to be conducted under the operations certificate; • Company identified and documented the safety accountabilities of management as well as operational personnel, with respect to the SMS but not comprehensive.	• No Safety committee or review board in the company; • No safety management review meeting
c. Appointment of key safety personnel	• Company already appointed Safety & Compliance Manager;	• Safety & Compliance Manager is appointed by company since March 2018
d. Coordination of emergency response planning	• Company has an ERP that laid down on the Operation Manual but not comprehensive.	• The Company ERP is not address all possible or likely emergency/ crisis scenarios; • The company doesn't have a plan and record for ERP drills or exercises; • The Company ERP doesn't address the necessary coordination of its emergency response/contingency procedures with the emergency/response contingency procedures of other organizations (Airport, ANSP, MRO, etc.); • The Company doesn't have a process to distribute and communicate the ERP to all relevant personnel, including relevant external organizations;

Table 2 IFM GAP Analysis Result … (Continued)

ICAO SMS FRAMEWORKS	CURENT SITUATION	GAP/REMARKS
1. Safety Policy & objectives		
		• No procedure for periodic review of the ERP to ensure its continuing relevance and effectiveness.
e. SMS documentation	The Company has SMS documentation in the chapter 3 of their Operation Manual.	• There is no a top-level SMS summary or exposition document which is approved by the accountable manager and accepted by the CAA; • No SMS implementation plan; • The Company doesn't have SMS manual;
2. Safety Risk Management		
a. Hazard identification	• In the chapter 3 of company Operation Manual explain about Hazard identification; • In the company Operation Manual already explained what kind of occurrences that need to report to Investigation board and CAA; • The Company has a procedure for investigation of all reported incident/accidents.	• The Company doesn't have voluntary report system and form for all employees; • Since operated the company doesn't have voluntary report or hazard report (no record); • The company never conduct hazard identification before.
b. Safety risk assessment and mitigation	• In the chapter 3 of company Operation Manual explain about Risk Assessment; • The company has a documented procedure of Risk Assessment.	• The company never conduct Risk Assessment before (no record); • There is no program for systematic and progressive review of all aviation safety related operations, processes, facilities and equipment subject to the HIRM process as identified by the organization.
3. Safety Assurance		
a. Safety performance monitoring and measurement	• The Company has identified safety performance indicators for measuring and monitoring the safety performance of the company activities.	• safety performance indicators are not including alert/target settings to define unacceptable performance regions and planned improvement goals; • There is no procedure for corrective or follow-up action to be taken when targets are not achieved; • the safety performance indicators are not periodically reviewed.

Table 2 IFM GAP Analysis Result … (Continued)

ICAO SMS FRAMEWORKS	CURENT SITUATION	GAP/REMARKS
3. Safety Assurance		
		• No procedure for periodic review of the ERP to ensure its continuing relevance and effectiveness.
b. The management of change	The Company has no formal process to identify changes which may affect the level of safety risk associated with its aviation products or services and to identify and manage the safety risks that may arise from those changes.	There is no procedure to review change.
c. Continuous improvement of the SMS	No monitoring or assessing of SMS in place.	• The company never conduct SMS internal audit; • No SMS Audit plan;
4. Safety Promotion		
a. Training and education	No SMS Training program in the company.	No Safety Promotion Program in the company.
b. Safety communication	No formal means for safety communication	

Improvement

At the end of this report, intern will explain what are the obstacles in completing the project in this internship. Besides that, Intern also provides conclusions from this Internship with recommendations that need to be done by the company as a continuation of this project.

Constraints.

Constraints in implementing internships are time constraints. Due to the administration process of visas and work permits in Germany which took a long time so that intern had worked long distances over several weeks. As a result, some works have not been carried out until now, such as:

1. Conduct internal safety and compliance audit to management, operational, and subcontractors such as AMO / MRO and Flight Dispatcher;
2. Conduct socialization of CMS, SMS and ERP manual to all employees;
3. Conducting safety meetings and safety briefings for all employees;
4. Revise the IFM Traviation Operation Manual.

Conclusions

The conclusion in completing the project on this internship are:

1. Based on the results of the SMS Gap analysis, Intern found the fact that the company does not have an SMS and Implemented SMS in place. Only as written formality in the operation manual and the contents are not comprehensive;
2. The Operational Manual does not fully comply with the rules based on Gap analysis with a checklist of LBA;
3. The company does not have an SMS, CMS, and ERP manual;
4. The company has never conducted hazard identification and risk assessment;
5. The company has never carried out an Internal audit;
6. There is no voluntary reporting system in the company.

Recommendations

The main output in this project is SMS, CMS and ERP Manual. The manual is only a guidance and a tool to help companies implement SMS and CMS. Therefore, the follow-up of this project must be carried out so that the company can be established suitable and reliable SMS, CMS and ERP systems in place.

Follow-up recommendations that must be made by the company are:

1. Establish a safety committee;
2. Establish SMS and CMS Implementation Plans;
3. Conduct SMS, CMS and ERP Manuals socialization for all employees;
4. Review and update of the Operation Manual;
5. Make internal Safety and Compliance audit plans;
6. Review hazard identification;

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