

Guideline for the Development of a Capable Training Program for New Hire Employees in the Design Area of an Aerospace Industry in Puerto Rico

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Abstract — *The aerospace industry is very sophisticated since their products and services needs to be in compliance with the highest levels of quality. Since currently this type of industry is new in Puerto Rico most of the processes are in a low level of mature especially due to the lack of an efficient training program. The Six Sigma tool DMADV (Define, Measure, Analyze, Design and Verification) was implemented in order to solve this situation. As a result of this project a guideline for the development of capable training program for new hires employees in the design department of an outsourcing aerospace company was successfully created. This guideline will help to develop a capable training program that will be aligned with all the needs of any outsourcing aerospace company and in addition its maturity level will be substantially improved by creating a high quality environment since the beginning.*

Key Terms — *Aerospace, DMADV, Outsourcing, Training Program.*

INTRODUCTION

The Puerto Rico (PR) Aerospace Industry is in an introductory and development phase in our market. Aerospace is a very diverse field, with a multitude of commercial, industrial and military applications. Aerospace design and manufacturing is a high technology industry that produces: aircraft, space vehicles, aircraft engines, propulsion units, and related parts among others.

Since the aerospace industry is new in PR most of the processes involve on the design area are in a low level of mature. The lack of mature and expertise of the processes are being generated, in part, by the lack of a training program for new hire

employees and in some cases deficiencies on the existing one. Due to the poor training process in the design area the quality of the products and services provide by the company are being directly affected.

The main purpose of this design project is to create a guideline for the development of a capable training program, to provide the best preparation and technical capabilities to the new hire employees of the design area of an aerospace outsourcing company.

RESEARCH DESCRIPTION

In the aerospace industry the levels of standards and requirements of design and manufacturing procedures are the highest since those are products that have to be 100% reliable.

This research is being performed to analyze the current training program for the new hire employees of an outsourcing aerospace company in order to indentify all the inefficiencies that it has. The creation of a guideline for the development of a capable training program will be part of the research in order to increase the technical capability of the new hire employees and in the same way to reach a maturity level in the aerospace industry especially for the design department. A capable training program is focused on provide the best preparation and at the same time to be in compliance with all the needs and requirements established by the customer and the aerospace standards. As part of the six sigma methodology DMADV is the tool or method that will be apply to analyze what is necessary to develop and implement an efficient new training process. DMADV stands for: Define, Measure, Analyze, Design and Verify.

RESEARCH OBJECTIVES

The main objective of this research is to create a guideline which will provide the essentials steps to develop a capable training program for the design area of an aerospace outsourcing industry. Another objective is to reach the customer satisfaction, loyalty and confidence at the time to request our services. Finally the long term objective will be to increase the level of maturity of the aerospace industry in PR.

RESEARCH CONTRIBUTIONS

The main contribution will be to prepare the new hire employees with all the technical capabilities and knowledge to perform all the tasks involve in the design area of an aerospace outsourcing company. But the most important contribution on this research is to create free from defects processes that supports the company operational excellence and in the same way provide high quality products and services to the customers. In this way the aerospace industry in PR will be substantially enhanced and expanded into our market and our worldwide reputation.

RELEVANT LITERATURE

Since the aerospace industry is in a developing phase in PR it is very essential that the manpower poses the proper preparation and capabilities in order to achieve success. To create a capable training process there are a key factors that needs to be considered. Some of those key factors are customer expectations, specifications, requirements and regulation, best equipment and latest technology, critical to quality (CTQ's), and business needs (mission, vision & goals).

Once the key factors are identified the training process could be develop in accordance to the specific needs. By the creation, implementation and standardization of a capable training process all the deficiencies presents on the processes, products and services provide by the design department of an aerospace company could be minimized and

eliminated. This will lead to a free from defects working environment, customer satisfaction and most important, the company success. The six sigma methodology DMADV is the tool that will be applied to this investigation.

Training Sense

The employees' training takes places once are being contracted, also when a new process, product or service will be implemented. Training is the process of enhancing the skills, capabilities and knowledge for doing a particular task. Training process molds the thinking and leads to quality performance of employees. This is a continuous process due to factors such as: requirements, customer expectations, new technology and special tasks between too many others [1].

Importance of Training

The training process is one of the most profitable investments an organization can make and is vital for its development and success. An employee will become more efficient and productive if is trained well. In order to develop an effective and capable training program within your organization it is necessary to consider the following four basic training steps [1].

- Step 1 - Establishing a "Needs Analysis": The activities to justify and validate an investment for training are identified. The techniques necessary for the data collection are surveys, observations, interviews and customer feedback. By determining training needs, an organization can establish what specific knowledge, skills and attitudes are necessary to improve the employee's performance.
- Step 2 - Developing Training Programs and Manuals: In this step the development of the job descriptions and its standards and procedures are established. The job descriptions should be clear and concise and may serve as a major training tool for the identification of guidelines. Once description is defined, a complete list of standards and

procedures should be established from each responsibility outlined in the job description.

- Step 3 - Deliver the Training Program: This step is responsible for the instruction and delivery of the training program. Once the trainers are designated, the training technique must be established. There are different ways of training techniques, but the most common methods are on-the-job training and off-the-job trainings.
 - On-the-job training is given to the employees within the everyday working duties (in the actual scenario) and is a simple and cost-effective training method.
 - Off-the-job training is provided away from the actual working condition (workshops, seminars and conferences) and it is generally used in case of new employees. This method is costly and is effective only if a large number of employees have to be trained within a short time period.
- Step 4 - Evaluate the Training Program: In this step is determined how effective and profitable the training program has been. Methods for evaluation are: pre- and post- surveys of customer feedback, the establishment of a cost/benefit analysis outlining your expenses and returns, and an increase in customer satisfaction and profits. Some of the benefits for evaluating a training program are:
 - Provide feedback on the trainer's performance, allowing them to improve themselves for future programs.
 - Indicate its cost-effectiveness.
 - Determine the overall effectiveness of the training program for the employees as well as the organization [2].

Benefits of a Capable Training

By establish a capable training program an organization and its employees will enjoy of different benefits such as: improves morale of employees, less supervision, fewer accidents, chances of promotion, and increased productivity [1].

Aerospace

Aerospace is a term commonly used to refer to the science and technology used at the industries that researches, designs, manufactures, operates and maintains vehicles moving through air and space. Aerospace is applied in a very diverse field such as in commercial, industrial and military. Design and manufacturing into the aerospace world is a high technology industry along with high standards, requirements and regulations that produces: space vehicles, aircraft, aircraft engines, propulsion units, satellites and related parts among others.

Aerospace Industry

The United States (US) has been the world leader in aerospace and aviation since the early 20th century as both the largest producer and marketplace. The US aerospace industry grew by around 8.15% in 2006 to exceed over 200 billions of dollars (Figure 1). The Bureau of Labor Statistics reported the aerospace industry employed 444,000 wage and salary jobs in 2004.

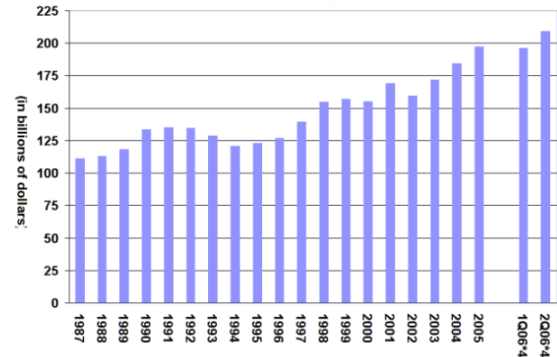


Figure 1
Aerospace Industry Sales

The federal government traditionally is the aerospace industry's biggest customer. The vast majority of contracts to purchase aerospace equipment are awarded by the Department of Defense and NASA. Employment in the aerospace industry has declined in recent years as a result of a drastic reduction in commercial transport aircraft orders, but a modest increase in orders are expected over the period up to 2014. Concern for the nation's security has increased the need for military aircraft and aerospace equipment [3].

Aerospace Industry in Puerto Rico

PR is quickly turning into an aerospace and environmental science business hub. Four National Science Foundation Engineering Research Centers based on the island, key research by The National Astronomy and Ionosphere Center, and the rapid development of the former Roosevelt Roads Naval Station confirms this. Many of the world's foremost innovative corporations are investing in PR.

PR's sound educational foundation provides a highly trained, young and bilingual workforce ready to meet tomorrow's technological challenges. PR has the #1 and #2 Hispanic engineering universities in the US PR is where top information, telecommunications, engineering and aerospace companies come to recruit their talent.

Frequent non-stop flights to the US mainland, world-class infrastructure and a deep talent pool make PR the ideal business location for the talent driven aerospace sector [4].

Six Sigma Overview

Six Sigma is a discipline, data-driven approach and methodology for eliminating defects in any process from manufacturing to transactional and from product to service. It was originally developed by Motorola, USA in 1981. The Six Sigma is applied in many sectors of industry and basically this system is a way to improve processes in work and manufacturing and the main goal is to eradicate defects. The main purpose of Six Sigma is to improve the quality of outputs by identifying and removing the causes of defects and minimizing variability in any manufacturing and processes. A Six Sigma defect is defined as anything outside of customer specifications. To achieve Six Sigma, a process must not produce more than 3.4 defects per million opportunities, which mean that the 99.99966% of the products manufactured are statistically expected to be free of defects [5].

There are two major methodologies in the Six Sigma system, they are DMAIC and DMADV. In this article, DMADV will be covered. DMADV is an extremely effective way to create a new product or a new process design. There are five steps in the

DMADV process, they include; Define, Measure, Analyze, Design Details and Verify the Design. Below are the five steps in more details.

- **Define:** In this phase the goals are defined in concurrence with the customer's needs and the company goals, schedule and guidelines for review are developed and assess risks.
- **Measure:** Critical to qualities (CTQ), production process capability, risk assessments and product capabilities are identified and measured. Customer's demands and requirements are clearly established.
- **Analyze:** The designs (products or processes) will be evaluated to determine whether the design is the best available and is aligned with the customer's needs and specifications or if another alternative can be better.
- **Design Details:** The design is developed base on customer's needs and specifications. In order to optimize a design, a design must usually be verified.
- **Verification:** Finally the design should be verified to corroborate that all the requirements are in conformance and expectations are meet. Once a design has been validated the deployment phase will begin and the lessons learned are documented.

METHODOLOGY

There are two major methodologies in the Six Sigma system: DMAIC and DMADV or DFSS. In this project, DMADV will be the preferred option due to its extremely effective way to create a new product or a new process design instead of DMAIC which is used for projects aimed at improving an existing business process and not to create a new one. There are five phases in the DMADV process (Figure 2). Before the implementation of this six sigma tool a target for a new process creation is identified from an emerging: the target consists in creation of a guideline to develop a capable training program for new hire employees due to the lack of technical capability in the design department of an outsourcing aerospace company in PR.



Figure 2
DMADV Model

Define Phase

On this first stage of the DMADV tool the team and its sponsor's needs to agree and be aligned on the project purpose. Also, the problem will be stated to achieve project main goal. This goal will be achieved by the implementation of some of the six sigma tools such as:

- Develop a Project Charter – this document is basically a condensed overview of the project. It provides a preliminary outline of the project's scope and objectives, identifies the participants in a project and defines their roles and responsibilities [6].
- Develop a SIPOC Diagram – also called “high level process map” and is used to identify all the relevant elements about a process improvement. SIPOC stands for Supplier, Inputs, Process, Output and Customers.

Measure Phase

The implementation of different six sigma tools will be present in this phase by analyzing a set of key parameters or CTQ's for the process success. The management of the design department of an aerospace company will pass through different six sigma methodologies such as surveys and series of interviews among others in order to identify their needs, specifications and expectations by obtaining their feedback and level of satisfaction and in this way transform those parameters into requirements and characteristics for the training program.

The employee technical capability is normally categorized by ranges such as A, B, C or D:

- Technical Capability A - the employee has the basic understanding of all the tasks involved within the design department but always will work under full technical guidance and supervision.
- Technical Capability B - the employee has a complex understanding of all the tasks involved within the design department and will work under minimum technical guidance and supervision and could provide mentoring to other employees with lower capability.
- Technical Capability C - the employee has a total understanding on all the tasks involved within the design department, performed tasks without any technical guidance and supervision and could provide mentoring to other employees with lower capability.
- Technical Capability D - the employee is an expert on all the tasks and subjects related to the department processes.

Pie charts will be another tool that will be used on this design project. Pie Charts are circular chart in which the circle is divided into sectors. Each sector visually represents an item in a data set to match the amount of the item as a percentage or fraction of the total data set [7].

Analyze Phase

The main reason of this phase is to make a good judgment of all the information and data collected in the measure phase to confirm the source of poor technical capabilities of the employees and the low maturity level of the company. A cause and effect diagram is one of the common tools used on this phase and will be used on this design project. This type of diagram sorts ideas into useful categories such as: methods, equipment, material, people, management and environment. After the implementation of the different methodologies the CTQ's will be identified. These parameters will be the main drivers for the guideline creation, but this project

will be more focused in the employee technical capability which hypothetically is the key parameter to guarantee satisfactory results.

Design Phase

After analyzed all the data, it could be determined that the best way to reach the primary focus of this project which is the employee technical capability is by the creation of a guideline for the development of a capable training program. A possible structure for the capable training program will consists in two stages:

- Stage 1: The employee will pass through a rigorous period of trainings related to all the tasks performed by the design department in order to achieve the necessary knowledge to perform any task.
- Stage 2: The employee will be entering to a phase of “On the Job Training (OJT)” to implement all the knowledge acquired on the first stage.

Verification

Once the guideline has been created, it should be verified. Verification usually occurs through pilot runs, surveys and benchmarking among others and it is necessary to validate the new design which in this case is the guideline for the development of a capable training program.

RESULTS AND DISCUSSION

After the implementation of Six Sigma DMADV and all tools within this method which were previously mentioned on the project methodology, the following results were obtained.

Figure 3 presents the project charter generated for this design project. This document denotes the project sponsor, leader and members along with their roles. In addition it provides an overview of the project schedule, description, scope and objectives.

The SIPOC diagram shown on Figure 4 presents all the relevant elements of this process improvement project which in this case is the

creation of a guideline for the development of a capable training program for the design department of an outsourcing aerospace company. The diagram provides a general overview of the all the processes within the design department of an aerospace company from its beginning to the end. This diagram is very helpful for the training program development since it's describe all the steps involved in any part design.

Project Title	Guideline for the Development of a Capable Training Program for New Hire Employees in the Design Area of an Aerospace Industry in Puerto Rico.		
Project Sponsor	Puerto Rico Aerospace Industries		
Project Leader	José A. Ayala Román		
Team Members	Rafael Nieves, Pham.D. (Design Project Advisor) Juan Del Pueblo (Manager of an Aerospace Design Area) Jose Del Pueblo (Supervisor of an Aerospace Design Area) Juana Del Pueblo (Supervisor of an Aerospace Design Area) Carlos Del Pueblo (Training Coordinator of an Aerospace Design Area)		
Event or Deliverable	Target Date	Responsibility	
Start Date	Aug 13, 2012.	Project Leader/Sponsor	
Project charter approved	Aug 27, 2012.	Project Leader	
Project plan completed	Sept 4, 2012.	Project Leader	
Project plan approved	Sept 6, 2012.	Project Sponsor	
Project team assembled	Sept 8, 2012.	Project Leader	
Project execution initiated	Sept 10, 2012.	Project Leader	
Project execution completed	Sept 21, 2012.	Project Leader	
Customer acceptance	Oct 26, 2012.	PUPR	
End Date (Project closed out)	Nov 1, 2012.	Project Leader/Sponsor	
Project Description			
This research consist on the establishment a guideline with all the necessary specifications and recommendations for the development of a capable training process for the new hire employees of the Aerospace Industry in Puerto Rico especially for the design department.			
Project Scope			
To promote and develop the aerospace industry in Puerto Rico.			
Project Goals and Contributions			
<ul style="list-style-type: none"> ➤ Offer the best preparation for the new hire employees. ➤ Provide the best in class quality products and services to the customers. ➤ Develop free from defects processes that support the company operational excellence. ➤ Develop and mature the aerospace industry in Puerto Rico in order to enhance our economy. ➤ Time and cost reduction. 			
Name	Date	Reason For Changes	Version
José A. Ayala Román	9/21/2012	Project Deployment	--

Figure 3
Project Charter for the Design Project

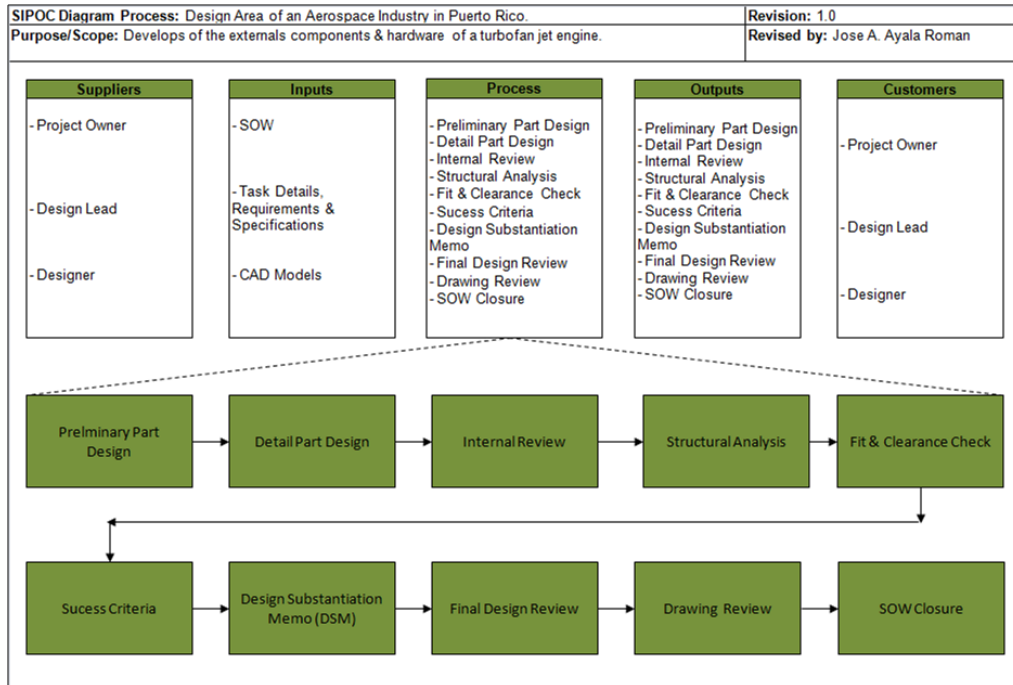


Figure 4
SIPOC Diagram for a Design Department of an Aerospace Company

Survey Results

This section presents and summarizes the results obtained from the survey provide to the management and experienced personnel of the design department of an aerospace company.

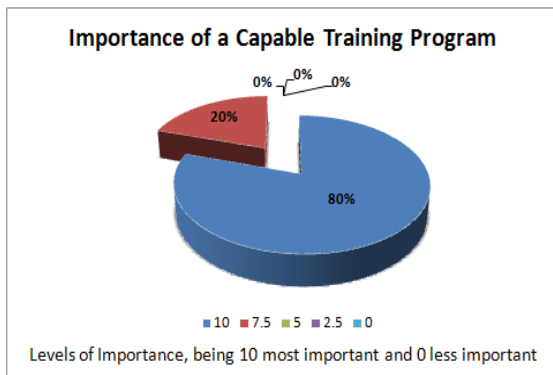


Figure 5
Level on Importance for Capable Training Program

From Figure 5 it could be observed that the 80% of the management personnel of the design department of an aerospace company consider that a capable training program for the new hire employees is very important.

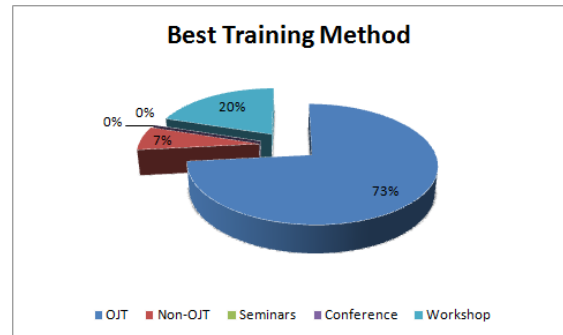


Figure 6
Best Training Method

In Figure 6 it could be observed that the 73% of the management personnel of the design department of an aerospace company consider that the On-The-Job (OJT) training method is the the best way to provide training. By the other hand a 20% consider workshops as another alternative.

Figure 7 revealed that an optimum time frame for a new hire employee to reach the technical capability A is about 12 weeks (3 months). This is a conservative approach taking into consideration that new hire employees in any type of industry has to go through a probatory period.

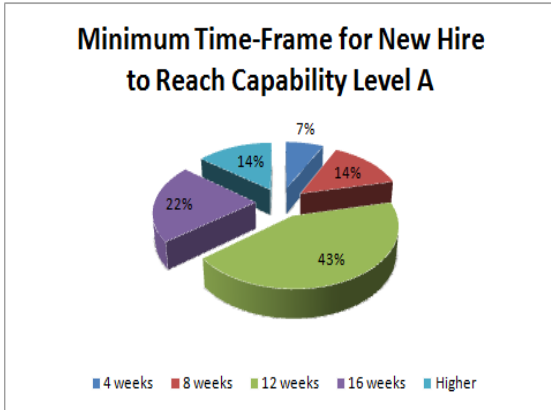


Figure 7
Minimum Time-Frame for New Hires to Reach Capability A

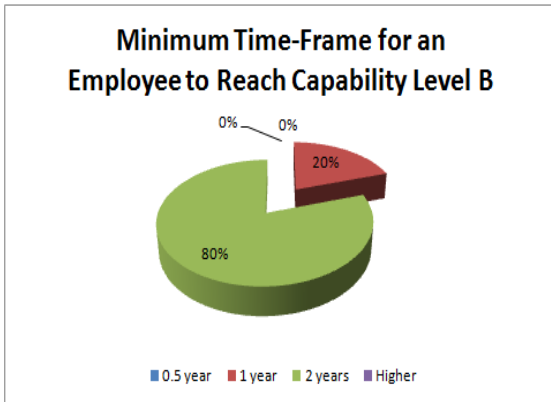


Figure 8
Minimum Time-Frame for Employees to Reach Capability B

Figure 8 revealed that the minimum time frame for an experienced employee to reach the technical capability B is around 2 years.

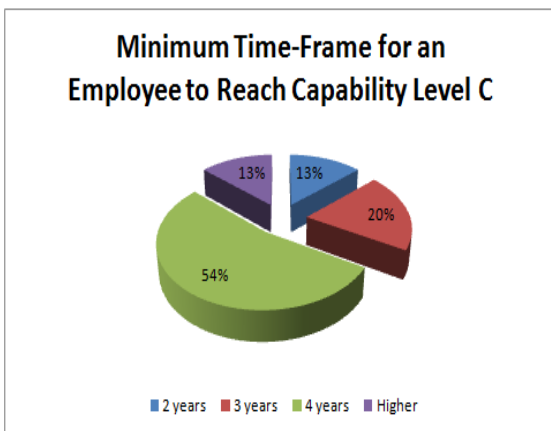


Figure 9
Minimum Time-Frame for Employees to Reach Capability C

Figure 9 revealed that the minimum time frame for an experienced employee to reach the technical capability C is around 4 years.

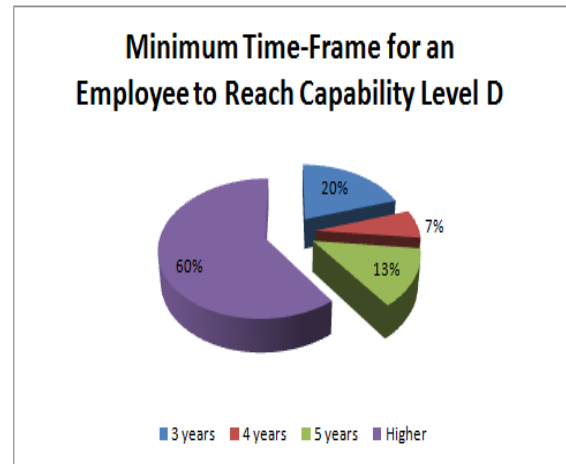


Figure 10
Minimum Time-Frame for Employees to Reach Capability D

Figure 10 revealed that the minimum time frame for an experienced employee to reach the technical capability D is higher than 5 years and based on the comments received from the surveys the normal time frame is more than 10 years.

The Cause and Effect diagram shown on Figure 11 revealed all the factors that contribute to the lack of a capable training program and poor technical capability on the employees. This diagram forms an essential part for the guideline development since it identified all the areas that need to be covered.

Design Phase

Based on the feedback received from the survey, the Cause and Effect diagram (Figure 11) and the premise that the focus of this design project is to increase the employees technical capability and the level of mature of the aerospace industry in PR, it has been determined that the implementation of a capable training program is totally necessary and imperative for any outsourcing aerospace company in the island. For this reason and in order to support this effort the following guideline has been created.

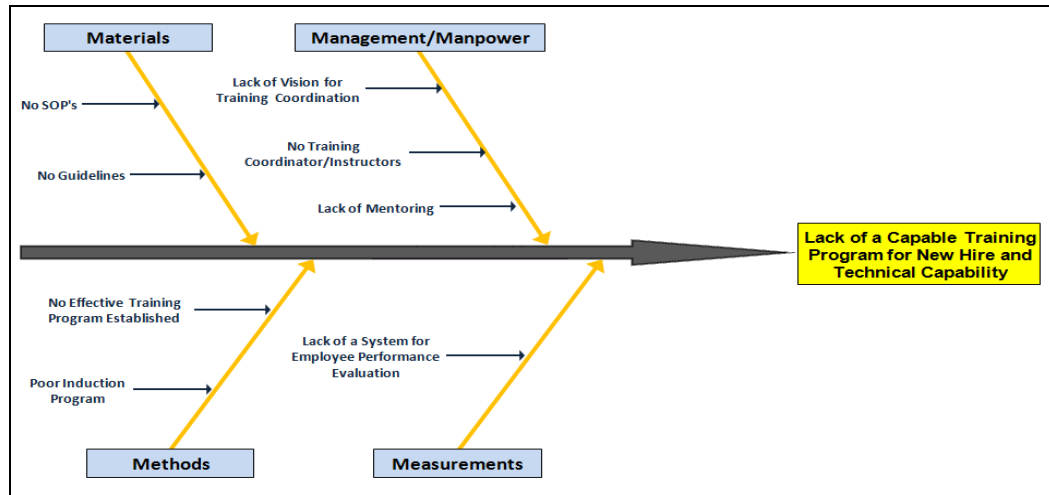


Figure 11
Cause and Effect Diagram for the Lack of a Capable Training Program for New Hire and Technical Capability in a Design Department of an Aerospace Company

Guideline for the Development of a Capable Training Program

Since the aerospace industry is in a developing phase in Puerto Rico most of the processes are in a low level of mature, especially those processes involved on the design area. One of the common factors that lead to the lack of expertise and mature of the processes is an inefficient training program for the new hire employees. For this specific reason the intend of this document is to provide a clear view of the basic needs and essential steps to develop a capable training program for new hire employees of the design area for an aerospace company in Puerto Rico.

- **Introduction**

Here of all the specifics of tasks, products and services provided by the design area of the outsourcing aerospace company will be briefly explained. In addition, an overview of the plan will be included into this section in order to provide a general idea of document content.

- **Purpose**

- In this section the company must state and clearly describe the purpose of the training plan including the intended audience. In this case, will be new hire employees or any experienced

employee who is new on the design area of the aerospace company.

- **Needs Analysis**

- This is the key factor for the development of a capable training program. It consist in perform a systematic exploration of the gaps between the current situation and the desired or necessary situation in relation to the issue in question. This analysis also examines specific organizational goals, climate, and internal and external constraints. Below is a set of the commons questions that should be considered to facilitate this type of analysis.
 - What the participants & organization want or expect from the training?
 - What administrative support and materials are already available?
 - What type of training method?
 - What do the participants know?
 - What does the facilitator know?
 - What are the goals and objectives of the training program in terms of the desired changes in knowledge, skills and attitudes of

the participants, and how to assess whether the goals/objectives have been achieved?

- The needs analysis is crucial to adapting of training into a specific work environment.

○ **References**

- In this section a complete and detailed list of all the documents that are fully related to all the tasks, processes and services within the design department will be included.
- Documents such as design guidelines, manufacturer specifications, program ground rules and SOP's (refer to Figures 12 & 13) among other will need to be covered in this area.

AEROSPACE INDUSTRY – DESIGN DEPARTMENT Manual of Standard Operational Procedure (SOP)			
INSERT PROCESS TITLE HERE			
EFFECTIVE DATE	DOCUMENT REVISION	PAGE X OF X	NUMBER
APPROVED BY: _____	TITLE: _____		
SIGNATURE: _____	DATE: _____		

1.0 **Purpose**

Provide a general overview of the process and its purpose.

2.0 **Scope**

Identify the intended audience and/or activities related to the SOP.

3.0 **Related Documents and Prerequisites**

Include all the information, documents and equipment required before proceeding with the listed procedure. For example: certifications, software, tools, design standards, customer specs and/or other SOP's.

4.0 **Definitions**

In this section identify and define frequently used terms that will facilitate the understanding of this SOP.

5.0 **Responsibilities**

Identify all personnel that have a primary role in the SOP and describe their responsibilities to entirely carry out this SOP.

6.0 **Environmental Health and Safety (EHS)**

Describe all the security equipments and procedures to perform the SOP in a safety environment.

Figure 12
SOP Template page 1 of 2

AEROSPACE INDUSTRY – DESIGN DEPARTMENT Manual of Standard Operational Procedure (SOP)			
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EFFECTIVE DATE	DOCUMENT REVISION	PAGE X OF X	NUMBER
APPROVED BY: _____	TITLE: _____		
SIGNATURE: _____	DATE: _____		

7.0 **Procedure**

Detail description of all the necessary steps to perform the specified task related to this SOP. The use of illustrations and reference documents is very helpful for this section.

Approvals

	Written by:	Revised by:
Name		
Title		
Signature		
Date		

Change History

Revision	Date of Effectiveness	Reason for Change

Figure 13
SOP Template page 2 of 2

• **Scope**

○ **Organization Unit Objectives**

- State briefly the overall organization objectives to design and implement the training program.
- Consult the needs analysis for the development of this section.
- These objectives will be developed in accordance to the specific business needs identified in the need analysis. Some of the common objectives are shown below:
 - Reduce error rates;
 - Improvement in morale and their attitude;
 - Higher productivity.

○ **Training Program Objectives**

- List here the objectives of the training and development program itself.
- Consult the needs analysis for the development of this section.
- The program objectives will serve as a measure of the program success.

- **Training Program**
 - **Training Prerequisites**
 - Induction program provided by human resources of the company. In this phase the employee will go thru the followings:
 - overall orientation of the company mission, vision and goals.
 - trainings on company policies and ethics.
 - request all the necessary access (networks, database, etc.).
 - **Types of Training**
 - In this section will be established the method that will used to provide the training. The two common methods are:
 - On the Job Training (OJT) with mentoring if possible.
 - Off the Job Training (workshops, seminars, conferences, etc.)
 - The type of training will depend on the business needs, please refer to the need analysis.
 - **Training Schedule**
 - Here the training schedule and time-frame will be established based on the business needs and the training method implemented.
 - If Off the Job Training will be implemented the normal time-frame for this method will be around 3 months.
 - **Training Logistic**
 - In this section, the logistic of the training program will be established; however it will depend to the type of training method selected.
 - Normally the OJT is the method implemented since it is the best way in where the employee will gain experience while at the same time the company will earn revenues.
- Non-OJT trainings are normally uses to provide the basics understandings of the tasks and processes involved in the design area of an aerospace company.
- **Required Resources**
 - **Materials & Equipment**
 - List here all the necessary materials and equipment for the training program based on the company needs. Examples of those are:
 - conference rooms with computers
 - instructors
 - training manuals & guidelines
 - **Roles and Responsibility**
 - In this phase, a training program coordinator and a team will be designated. The most common responsibilities are:
 - perform the needs analysis
 - create the training program
 - support the entire process (program updates and improvements, mentoring, etc.)
 - **Resources**
 - List here the estimated cost and labor amounts required for the training program phases such as: development, implementation and evaluation.

Verification Process

As soon as the Capable Training Program has been developed based on the guideline, it will be verified. This process will consist on a rigorous evaluation performed by a committee composed of experts of each area of the design department in order to verify and confirm that it is in compliance with the design goals, customer's needs and company requirements in order to be validated. After the verification and validation processes the training program will be created and deployed.

Once the program has been deployed, a system for the evaluation of the employee's performance and technical capability will be implemented. This system will consist in the capability assessment

process in where the employee will be evaluated at least once a year. The table below shows the criteria of evaluation for the recommended time-frame on technical capability transition.

Table 1
Technical Capability Transitions Criteria

Technical Capability Transitions Criteria	
Transition	Time-Frame
New Hire to A	3 months
From A to B	2 years
From B to C	4 years
From C to D	10 years +

Finally this type of assessment will be one of the most important criteria for the capable training program validation.

CONCLUSION

The outcome of this design project is considered satisfactory. The study was conducted and focused on the improvement of the low level of mature and expertise of a design department for the aerospace industries in PR. In order to address this situation a guideline for the development of a capable training program was successfully developed.

This guideline provides the essentials steps for the development of a capable training program which will provide the best preparation and technical capabilities for new employees. In addition an SOP template was created to support this process. As part of the recommendations for this type of effort is that a good training logistic should be a combination of the two most common training methods: On the Job Training (OJT) and Off the Job Training (Non-OJT). Also it is highly recommended for a future research that is necessary to perform a design project of the capability assessment procedure in order to provide further details and guidance about this process. By the other hand one of the limitations was the execution phase and verification process of this project due to time limitations.

Anyhow the objectives of this project has been achieved because with the proper use of the guideline any aerospace company in PR will ensure to provide a top level preparation for the employees, the best in class products and services to the customers, free from defect processes to support the company excellence, time and cost reductions and most important the development and mature of the aerospace industry in PR which will lead to enhance our economy.

REFERENCES

- [1] Management Study Guide. (n.d.). <http://www.managementstudyguide.com>. Retrieved May 5, 2012, from <http://www.managementstudyguide.com/training-of-employees.htm>
- [2] Infande, A. (n.d.). SelfGrowth - THE FOUR BASIC STEPS IN THE TRAINING PROCESS. Retrieved May 5, 2012, from <http://www.selfgrowth.com/articles/Infande4.html>
- [3] CASE. (n.d.). Council of American States in Europe; Aerospace. Retrieved April 29, 2012, from <http://www.case-europe.com/industries/industry/Aerospace.2.aspx#States>
- [4] CASE. (n.d.). Council of American States in Europe; Puerto Rico Aerospace. Retrieved April 29, 2012, from <http://www.case-europe.com/stateindustries/stateindustry/AerospacePuertoRico.44.aspx#Industries>
- [5] I Six Sigma - What is Six Sigma? (n.d.). Retrieved May 8, 2012, from <http://www.isixsigma.com/new-to-six-sigma/getting-started/what-six-sigma/>
- [6] ADMIN. (2012, April 22). Bright Hub; A Project Charter - What Is It? Retrieved May 26, 2012, from <http://www.brighthub.com/office/project-management/articles/64912.aspx>
- [7] ADMIN. (n.d.). Interactive Maths Series Software; Pie Charts Retrieved October 1, 2012, from http://www.mathsteacher.com.au/year8/ch17_stat/06_pie/charts.htm