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Program Evaluation Aircraft Maintenance Training Organization On Aeronautical Engineering Diploma Study Program

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Abstract. The purpose of this study was to evaluate the program of incorporating the Aircraft Maintenance Training Organization into the aeronautical engineering diploma study program and find out to what extent the application of the requirements and procedures at UNSURYA (Universitas Dirgantara Marshal Suryadarma) in supporting the establishment of D-3 AMTO UNSURYA which was recognized or approved by the Ministry of Transportation. RI and the Ministry of Research, Technology and Higher Education of the Republic of Indonesia. With a qualitative approach through evaluative methods and the CIPP model (context, input, process, product) using the methods of documentation, interviews, observations and questionnaires. From this study obtained results and conclusions regarding; (1) aspects of program needs, (2) aspects of program problems, (3) aspects of program objectives, (4) aspects of curriculum, (5) aspects of human resources, (6) aspects of budget, (7) aspects of facility planning, (8) Aspects of readiness, (9) aspects of establishment mechanisms, (10) aspects of barriers, (11) aspects of administrative standardization, and (12) aspects of competency standardization. The evaluation results show that there are still unfulfilled requirements in the implementation of AMTO at UNSURYA, thus hampering the process of granting AMTO establishment permits.

Keywords: Aircraft Maintenance Training Organization-147, AMTO UNSURYA, Evaluation Program

1. Introduction

Currently, the development of the aviation world, both in Asia and in Indonesia, is experiencing rapid growth. In line with these developments, the need for safe and reliable air transportation has increased, and has also contributed to the development of the aircraft maintenance industry or Maintenance, Repair & Overhaul (MRO), namely aircraft maintenance facilities that are very important in supporting the aviation industry. In the aviation industry, the rules regarding aviation safety are absolute things that must be considered and implemented by airlines management in managing airline companies. The role of MRO is to carry out aircraft maintenance according to airlines' requirements as stated in the OAMP (Operator Aircraft Maintenance Program) so that aircraft are always in airworthy condition. This Maintenance, Repair & Overhaul business makes an industry with a value of 75 billion US dollars / year and a growth of 4% / year.

In Asia Pacific outside of China, this market is worth 13.3 billion US dollars/year, while Indonesia currently hasquite large airplanes and booked aircraft orders of the same amount, the Maintenance, Repair & Overhaul industry is only worth 1 million US dollars. / year. As the MRO industry develops, six thousand aircraft mechanics or engineers will be needed. The number of technicians or mechanics is still minimal, currently in Indonesia there are less than three thousand people. Facts on the ground currently show that educational institutions are not ready to produce human resources for aircraft technicians who are ready to use and the intense competition in the field of work urges the demands of graduates of quality educational institutions.

As an effort to realize and practice the tridarma of higher education and anticipate the lack of interest in the three-aeronautical engineering diploma study program, since 2014 the faculty of aerospace technology UNSURYA (Universitas Dirgantara Marshal Suryadarma) has taken several approaches to both industry and the profession, as well as implementing community service programs. Based on law no. 20 / 2003 Article 20 paragraph (2) that universities have obligations in providing education, research, and community service. The approach to the industry in this case PT GMF-AA (Garuda Maintenance Facility AeroAsia) is carried out with the aim of getting a complete job description for every possible position for D-3 aeronautical engineering graduates. The government is also involved, namely the Department of Airworthiness and Aircraft Operations of the Ministry of Transportation, Republic of Indonesia. (DKPPU) with the Ministry of Research, Technology and Higher Education as the standard setter of the government component.

The implementation of the diploma program combined with the BAM (Basic Aircraft Maintenance) program at the AMTO (Aircraft Maintenance Training Organization) according to the program background, was initially limited to equipping graduates with the knowledge and skills as an aircraft mechanic who had a license or competency certification but the law Aviation requires a license or competency certification to be from a place of education and training that is recognized or ratified by obtaining certification from the Feasibility Service of the Ministry of Transportation of the Republic of Indonesia in accordance with the Civil Aviation Safety Regulation (CASR Part 147).

Based on the results of preliminary research, several problems were found that could cause the implementation of the collaboration of these two programs to be less effective and could become an obstacle in obtaining certification (approval) for the establishment or implementation of AMTO at UNSURYA from the airworthiness department. Some of these shortcomings are the impetus for this study to evaluate the implementation of the AMTO program in the three-aeronautical engineering diploma study program in the context of establishing an AMTO at UNSURYA which is recognized or certified by the Airworthiness Service of the Ministry of Transportation of the Republic of Indonesia.

2. Theoretical Framewor

2.1. Evaluation Concept

Evaluation is closely related to the effort to give an assessment. In carrying out the assessment there are several main activities carried out. (Rossi, 2004). As stated by Rossi above, the first activity carried out in the assessment process is a needs assessment, by asking whether the program has been properly conceptualized on the intended social problems? The second activity is program theory, which assesses whether the supposed program theory is consistent with social

science knowledge and is the theory internally consistent? The third activity is implementation, which askswhether the program has been properly implemented at the required intensity? The fourth activity is assessing the impact, which relates to the question of whether the program is effective in realizing the desired things. The fifth activity is efficiency, which asks whether the benefits for the resulting impacts are in accordance with the costs incurred for the program? The evaluation is carried out with reference to several objectives, Stake stated that there are five main objectives of evaluation, namely: First, assessing the achievement of goals (assessing goal attainment). Second, assisting organizational development (aiding organization development). Third, assessing contextual quality (assessing contextual quality). Fourth, study the policy (studying the policy). And fifth, legitimizing the program and deflecting criticism (legitimating the program and deflecting criticism). (Stake, 2004). the extent of conformity between standards and actual achievements.

2.2. Program Concept

Programs are designed to make a difference in people's lives or improve our environment. Related to the program concept, several experts include Newcomer, Hatry, and Wholey. The program is an open system that has implications and program inputs in the form of the required resources in the form of money, people, equipment, facilities and knowledge with a description of the work that has been done as an implementation of the program.

2.3. Program Evaluation Concept

After knowing the definition and describing the evaluation concept and the program concept separately, the next step is to describe or define the program evaluation concept used in research on the AMTO Implementation Program in the Aeronautical Engineering Diploma Three Study Program.

Program evaluation is the systematic application of methods to ask questions about program implementation and outcomes. Furthermore, Kathryn E. Newcomer, Hatry, and Wholey also said that there are five basic questions that must be answered when a program is considered for evaluation and monitoring, namely:

1) Can the results of the evaluation influence decisions about the program?
2) Can the evaluation be carried out on a regular basis to be useful?
3) Is the program significant enough for a useful evaluation?
4) Can program performance be viewed as a problem?
5) Where can the program be developed?

In the same vein, Kathryn E. Newcomer, Hatry, and Wholey add that there are two types of evaluation: a) formative evaluation, evaluation to improve the way the program is run, and b) summative evaluation, evaluation that measures program outcomes and impacts over the course of its life. programtive, evaluation that measures the results of the program and its impact during the course of the program or after it is implemented (Newcomer, Hatry & Wholey, 2010: 8). Furthermore, Stufflebeam and Shinkfield explained, the standards that can be used in program evaluation include: 1) Utility. Evaluation must be useful, addressed to the person or group involved in the evaluation or responsible for the implementation of the program being evaluated, 2) feasibility. The evaluation must meet the feasibility aspect, which must carry out evaluation procedures that are economical and can be operated within the program environment. Evaluation must also be kept away from things that can disrupt or harm the program, 3) propriety. Evaluation must be done by meeting the conditions of fairness. Therefore, the evaluation must have a clear basis, have a

written agreement, 4) accuracy. Evaluation must be carried out accurately, so it must truly describe the program as planned and the actual conditions carried out. In addition, it is also necessary to explain the background and program settings. (Stufflebeam & Shinkfield, 2007: 87-88).

Based on the description of the program evaluation, program evaluation is synthesized as being carried out systematically using valid and reliable research methods to provide an assessment of organized activities in achieving common goals so that conformity with predetermined standards or criteria can be determined.

2.4. CIPP Evaluation Model (Context, Input, Process and Product)

There are six models of evaluation, according to the researcher, the CIPP model is the most appropriate or appropriate the researcher chooses to evaluate the program that the researcher makes as the object of research. CIPP is a model popularized by Daniel L. Stufflebeam. Consists of evaluation of context, input, process and product. Stufflebeam and Shinkfield explain as follows: In context evaluation is assessed regarding the needs, problems, assets and opportunities for decision makers in defining their goals and priorities and other users in assessing them. The input evaluation assesses alternative approaches, action planning, staff planning, and budgeting the feasibility and potential cost-effectiveness of meeting the targeted needs and objectives to be achieved. Process evaluation assesses the implementation plan in helping staff carry out activities and assisting the wider party to assess program implementation and interpret the results. Product evaluation, on the other hand, is identifying and assessing results, whether desired or not, to help staff maintain the organization's focus on achieving important results. Product evaluation is also related to impact, effectiveness, sustainability and portability. (Stufflebeam & Shinkfield, 2007: 326-327). The CIPP Stufflebeam evaluation model is a comprehensive framework for evaluating projects, personnel, products, organizations from formative and summative evaluation systems. (Stufflebeam & Shinkfield, 2007).

Tyler said the evaluation model after averaging with its usefulness, feasibility, appropriateness and accuracy, the best approach is CIPP. This evaluation model has an improvement/accountability category, and an applied evaluation model. Unlike other traditional evaluation approaches such as the Tylerian Evaluation Rationale.41 The CIPP Evaluation Model is designed to systematically guide evaluators and stakeholders in placing relevant questions and conducting assessments at the beginning of the project (context and input evaluation), while progressing. (evaluation of input and process), and when finished evaluation (evaluation of product). (Tyler, 1942: 59). Specifically, the context of the evaluation component of the CIPP Evaluation Model can help identify service providers' learning needs and community needs. The input evaluation component can help describe a project response that is best addressed according to identified needs. Then, the process evaluation component monitors the project process and potential procedural bottlenecks, and identifies the need for project adjustments. Finally, the product evaluation component measures, interprets services, their worthiness, significance and fairness. (Zhang, 2011: 59).

Stufflebeam published a tool for implementing the CIPP Evaluation Model for long-term impact assessment and continuous improvement in a checklist. This list was created by Stufflebeam after evaluating the program over a span of 8 (eight) years from 1994 to 2002. This checklist emphasizes the question, “Did it succeed?” (is the program

successful?) or the product evaluation section is divided into evaluation of impact, effectiveness, sustainability, and transportability. This checklist also refers to the sub-question of the CIPP evaluation, namely, are the beneficiaries right on target? Are their needs met?, are the benefits to the beneficiaries sustainable?, are the profit-making processes proven to be delivered and adapted for effective use in other settings? This checklist is designed to help evaluators evaluate programs with relatively long-term goals. The main function of the checklist is to help evaluators report evaluations in a short time which helps groups to plan, implement, institutionalize, and/or disseminate services effectively for target utilization. Other functions of the checklist are to help evaluators review and assess the history of the program and issue a summative evaluation report based on its merits, worth, honesty, significance, and learning outcomes.

The CIPP model has the advantage of a complete framework, starting from the stages of helping to develop goals (context evaluation), assisting with proposals (Input evaluation), Process evaluation functioning to direct implementation (Process evaluation), to provide decisions that regarding the results of the evaluation of program implementation (Product evaluation). Another feature of this model is that it provides descriptive information at each stage and is an exposition of the standard criteria used as the basis for assessing and making decisions.

2.5. Aircraft Maintenance Training Organization (AMTO)

AMTO is the place where the Training Course is held, which is able to produce graduates who have competency standards in the field of aircraft maintenance in accordance with CASR Part 147 (Civil Aviation Safety Regulations). DKPPU Regulation concerning AMTO Standards to be able to operate, maintain or care for, repair, analyze disturbances or damage, to ensure safety, security, in the flight process, by following the educational process from theory, practice, on job training and exams to get a basic certificate / basic license with competence in the field of aviation as evidenced by the issuance of a certificate of competence by education providers and the issuance of an Aircraft Engineering license by DKPPU. With the competencies and licenses possessed, the graduates will become aviation personnel in the field of Aircraft Engineering, consultants and teaching staff.

3. Research Method

The research in this dissertation uses a qualitative approach through evaluative methods and the CIPP (context, input, process, product) model developed by Stufflebeam. Data collection techniques used in this study were interviews, observation, and documentation. The data analysis procedure in this dissertation research consists of three streams of activities that occur simultaneously, namely data condensation, data presentation and verification/drawing conclusions as stated by Miles and Huberman. From the distribution of the questionnaire, the data obtained from filling it out based on the linkert scale will then be tabulated in excel form and then look for the average of each item, its validity and reliability. The construct was tested by looking at the Kaiser Mayer Olkin (KMO) expected value of 0.5 (> 0.5). Data analysis was carried out to process quantitative data in this study. In general, the data analysis stage from the questionnaire results obtained is to calculate the average score according to the scoring guidelines of each aspect then converted into qualitative criteria by referring to the guidelines in table 3.1 is to change the average score in the form of quantitative data into qualitative, quantitative data converted into qualitative data with reference to the score conversion formula to a five-scale value. (Eko Putro Widoyoko S, 2014: 238).

Table 1: Conversion of Scores into Values on a 5 . Scale

Mark	Score	Criteria
A	X Xi + 1.8 SBi	Very good
B	Xi + 0.6 SBi X Xi + 1.8 SBi	Good
C	Xi - 0.6 SBi X Xi + 1.8 SBi	Good enough
D	Xi - 1.8 SBi X Xi - 0.6 SBi	Less
E	X Xi - 1.8 SBi	Very less

Based on these calculations, the conversion of quantitative data into qualitative using a Likert scale can be concluded in table 2 below.

Table 2: Conversion of Quantitative Data into Qualitative Data With Likert Scale

Score	Interval Score	Category
5	$\times > 4{,}2$	Very good
4	$3{,}4 < \times \leq 4{,}2$	Fine
3	$2.6 < \times \leq 3{,}4$	Pretty good
2	$1{,}8 < \times \leq 2{,}6$	Less
1	$\times \leq 1{,}8$	Very less

The media is said to be valid if the average score obtained by the two validators is in the Good or Very Good category.

4. Evaluation Results and Discussion

This research was conducted to evaluate the program for the establishment or establishment of an aircraft maintenance training organization in the aeronautical engineering diploma study program in Elementya.

Most of the data in this study were obtained in the form of narratives or sentences sourced from informants. Three techniques in data collection were carried out, namely interviews, observation, and documentation. The data obtained based on the results of observations described in the form of qualitative and quantitative data. The questionnaire or questionnaire contains several statements regarding the context, input, process, and results obtained in the questionnaire instrument arranged according to a grid using a Liker scale in place of categories. Research subjects can only answer the questionnaire according to the real situation in the AMTO UNSURYA program. The results of the validation in the assessment of the instruments that have been made show the following:

4.1 Background or Context

The first stage in program evaluation with the CIPP model is the background or context. There are several aspects that need to be evaluated related to the program background

or context, namely; program needs, program problems, and program objectives to assist decision making in defining goals, priorities and outcomes.

Aspects of program needs in this study, there are two components that are evaluated, namely, clarity of program graduates and clarity in fulfilling the requirements of the AMTO establishment program. The results of distributing questionnaires and interview answers for the "Clarity graduate program" component as a whole show a value of 4.3 this means it has a weighted value in the very good category and the component "Clarity in fulfilling the requirements to realize AMTO at UNSURYA is recognized and approved " shows a value of 3.3 so that it is classified as a fairly good weighting classification.

Furthermore, in the aspect of program problems, there are several components that need to be evaluated related to this, the suitability of the curriculum integration, the need for human resources that are in accordance with the standards with the required competencies, conformity in fulfilling the required facilities, and supporting policies/regulations. The data from the questionnaire on the context aspect of "the suitability of combining curriculum" AMTO with the curriculum of the D-3 aeronautical engineering study program showed good results, the results listed showed a value of 4.1 this means it has a weighted value in the good category. The next problem related to the suitability of HR needs with the required competencies shows a value of 2.1, this means that it has a weighted value in the poor category. Next, regarding the suitability aspect in fulfilling the required facilities, it shows a value of 2.5, this means it has a weighted value in the poor category. And furthermore, related to the regulations that apply to activities that meet the requirements for establishing AMTO in the D-3 aeronautical engineering study program, the results of the research show that these activities have been complied with by policies/regulations, so that the supporting policy/regulatory aspects get an assessment weight of 3.8 with the category good. The final aspect of the background is the purpose of the program. Based on the research results from the evaluation of the implementation of the AMTO implementation in this D-3 aeronautics study program, it resulted in the appropriate goals but not yet fully realized optimally. This is also seen in the weighting of the values obtained, namely 2.5. The AMTO establishment program, as it is known, will receive recognition (approval) after fulfilling the provisions in accordance with the rules or legal basis for the establishment of AMTO in CASR Part 147 that applies from DKPPU.

From the results of the analysis of the context aspect, the results of the evaluation can then be summarized in table 3 below.

Table 3: Conformity Analysis Stages of Background Aspects (Context) AMTO Program in Aeronautical Engineering Diploma

Stages Background (context) AMTO Program in Aeronautical Engineering			
Description			Evaluation
Objective	**Empirical Data**	**Criteria**	
• Meet needs requirements to be D-3 AMTO the Acknowledged (approved)	• Graduation Requirement D-3 ready to use and have a license / basic aircraft certificate maintenance • Need to realize Recognized D-3 AMTO (approved) by DKPPU and Dikti	• Requirement to pass D-3 licensed / basic aircraft certificate maintenance fulfilled by being remote GMF- AA class • Need fulfillment requirements in the program AMTO establishment is appropriate with CASR- 147 yet fulfilled	• fulfillment Condition referring to the rules or legal basis in the program AMTO's establishment in accordance with the CASR Part 147 optimally required as the equirements.
Objective	**Empirical Data**	**Criteria**	**Decision**
• Problems related to the process of realizing the establishment of D-3 AMTO UNSURYA	• Requires synchronization curriculum integration AMTO with program D-3 engineering studies Aeronautics • HR needs that meet Standards Competence • Need for Infrastructure / facility support • Still need to be optimized in implementation of regulations / policy	• Curriculum integration is not optimal • There is still a lack of quality human resources in accordance with the requirements. • Facilities have not complied with CASR-147 Requirements • Need to do Optimal. implementation of regulations/policies	• Organized management of D-3 AMTO program implementation and support will solve problems which exists.
• The purpose of establishing AMTO in aeronautical engineering diploma study program	• The D-3 AMTO UNSURYA preparation program has not been optimally achieved.	• The D-3 AMTO Preparation program Has not been fully implemented in accordance with CASR -147 due to the limited ability of the manning personal	• The process of establishing D3 AMTO UNSURYA which has received permission or is approved from DKPPU has not met expectations

Source: Summary of Evaluation Results by Researchers

4.2 Input or Program Planning

A program will require adequate input or planning for its success. From the evaluation of this program, the inputs needed are curriculum, human resources, budget, facilities and curriculum. These factors will determine the success of the AMTO program in the D-3 aeronautics study program in accordance with its vision and mission. The results of the evaluation of each of these factors can be explained with the required input as follows. The data from the questionnaire on the input aspect of "Curriculum", shows a good value (weighted value of 4.1). This can be seen clearly from the results of the questionnaire and field observations which show that the results of compliance with the requirements refer to the rules or legal basis in the AMTO establishment program in accordance with CASR Part 147. Furthermore, in the "Human Resources" aspect, the input factors that have a major role in the realization the vision and mission of implementing the AMTO program establishment in the aeronautical engineering D3 program is human resources, where the main role is to manage other resources such as budgets and facilities so that their functions can be effective and efficient. Abundant budgets and facilities are not a measure of the amount of aid for these resources, but must be supported by quality human resources in managing them. The data from the questionnaire on the "HR" input aspect, shows a poor value (weighted value of 2.1). From the results of questionnaires and field observations, which show that the results of compliance with HR requirements that refer to the rules or legal basis in the AMTO establishment program in accordance with CASR Part 147, are still far from sufficient. The next aspect is the resource which also has an important role for the successful implementation of a program is the budget. The function of the budget is to finance all program operational activities as planned. If the budget is not adequate, it will hamper the activities that have been planned, and result in the failure to implement or achieve the objectives of a program. The data from the questionnaire on the input aspect of "Budget Adequacy", shows a weighted value of 3.3 (fairly good). The next input is related to the fulfillment of facilities. Facilities are one of the factors needed in an effort to successfully implement a program or activity. Adequate facilities are useful for accelerating and supporting the implementation of tasks or work. Likewise, in the process of implementing the AMTO program in the D-3 program at UNSURYA, the availability of adequate facilities is very much needed. AMTO must have adequate facilities according to the number of needs. The facilities for the AMTO program are defined in CASR-147. The data from the questionnaire on the input aspect of "Sufficiency of Facility Support", shows a poor value (weighted value of 2.5). The provision of facilities is an organizational effort to be able to expedite the course of an activity/work program. . The last aspect of input is readiness, which is no less important than all of the above. There is readiness from the program implementation process itself in the form of administrative readiness such as determining schedules, making implementation orders and also preparing personnel who will be on duty in the form of upgrading. The data from the questionnaire on the input aspect of "readiness for implementation", shows a weighted value of 3.8 (good). The readiness referred to in this case is the cooperation program for the implementation of the AMTO program as a remote class extension class from GMF AA.

From the results of the analysis of the input aspect, the results of the evaluation can then be summarized in table 4 below.

Table 4: Conformity Analysis of Input Aspect Stages AMTO Program in Aeronautical Engineering Diploma

Stages of Input AMTO Program in Aeronautical Engineering Diploma			
Description		Evaluation	
Objective	Empirical Data	Criteria	Decision
• curriculum	• Requires quantity or Unit Load Semester Credit (SKS) • Requires courses taught	• Synchronization of merging curriculum has not been proportionate to implementation time • not fully synchronous there are still overlapping courses in the implementation	• Need to be more prepared both in terms of number, credits and courses related to the type of competence with needs.
• HR in the Implementation of AMTO program implementation	• Requires a proportional presence in the number of HR carrying out the process according to CASR- 147 • Requires understanding from management for HR especially in user recruitment /placement	• The number of crew members is not proportional to the number needed according to CASR Part 147	• It is necessary to be More prepared, both in terms of number and capacity of HR related to the appropriate type of competence in CASR Part 147
• Budget	• requires a budget that fits the needs of the process support the establishment of the recognized D-3 AMTO • centralized funding Sources are carried out in Yasau for capital expenditures and non-operational goods AMTO operational funding is carried out at UNSURYA	• limited amount of Budget for AMTO activities • a centralized funding system that has been adapted to budget line / budget provisions	• with limited budget AMTO must be able to give priority scale by doing sorting competency needs.
Objective	Empirical Data	Criteria	Decision
• Facility	• computer network connectivity. • requires appropriate practice facilities in CASR Part 147	• there has been a connectivity network for facilities teach teaching. • there are no facilities for airplane practice according to requirements	• Need to optimize the network connectivity between use with implementers so that teaching and learning can be better effective & efficient. • It is necessary to immediately set up practical facilities that are in accordance with what is needed required

• Implementation readiness	• implementation of administrative readines (scheduling, making wai etc.) .• preparation of the D-3 AMTO establishment st is carried out (there is cooperation with GMF as remote class or extension class GMF)	• readiness has been implemented from the administrative side of the work same as GMF AA as remote class or extension class	• It is necessary to further improve readiness by fulfilling all requirements in CASR Part 147

Source: Summary of Evaluation Results by Researchers

4.3 Implementation (Process) of Program Planning

The most important stage and determine the success of a program is program implementation. The goals of the program are unlikely to be realized, even if they are well planned if not implemented. Likewise, in this implementation stage, it must be carried out as planned. Aspects related to the implementation (Process) of the D-3 AMTO program planning are the application of learning methods, recruitment of teaching staff and staff, human resource development, timeliness, evaluation and monitoring and obstacles. The focus in the process stage is the establishment mechanism and obstacles. From the results of interviews and observations, it shows that the implementation of the AMTO program in the D-3 Aeronautics study program in order to get approval (approval) must be carried out in accordance with the rules or legal basis for the establishment of AMTO in CASR Part147 (Civil Aviation Safety Regulations) applicable from the Ministry of Airworthiness. Republic of Indonesia Transportation. The data from the questionnaire on the aspect of the "Establishment Mechanism" Process, showed a poor value (weighted value of 2.1). The mechanism for implementing learning methods by educators is in accordance with the rules in CASR Part 147, while for the organization of HR recruitment or teaching staff/staff the number and competencies required are in accordance with CASR Part 147 and HR development has a poor score, this can be seen from the results Questionnaires and field observations show that these two things are not sufficient for compliance with the requirements of CASR Part 147 (Civil Aviation Safety Regulations). And the next Process aspect is "Obstacles". Barriers always exist in the implementation stage of a program, which causes a program not to provide optimal results. Likewise with the implementation of the D-3 AMTO UNSURYA program, there were found obstacles in its implementation. The data from the questionnaire on the Process "Barriers" aspect, shows a weighted value of 2.1 (not good). For the mechanism for implementing learning methods by educators, it is in accordance with the rules in CASR Part 147, while for HR recruitment or teaching staff and staff, the number and competencies required and HR development according to CASR Part 147 have a poor value, this can be seen clearly from the results Questionnaires and field observations show that these two things are not sufficient for compliance with the requirements of CASR Part 147 (Civil Aviation Safety Regulations).

From the results of the analysis of the implementation (process) aspect, the evaluation results can then be summarized in table 5 below.

Table 5: Conformity Analysis of the Stages of the Implementation (process) of the AMTO Program at the Diploma in Aeronautical Engineering

Stages of the Implementation (process) of the Aircraft Maintenance Training Organization Program			
Description			Evaluation
Objective	**Empirical Data**	**Criteria**	**Decision**
The mechanism for establishing the D-3 AMTO UNSURYA program which acknowledged (approved)	the mechanism of The applied learning method is running according to the applicable provisions in CASR–147.21 recruitment that has been carried out by e D-3 AMTO program for educators and sta according to the rules in CASR- 147.17		• More improved mechanisms in support D-3 AMTO establishment program • Recruitment must be carried out in accordance with rules in CASR Part 147.17 in support of the program establishment of D-3 AMTO
Objective	**Empirical Data**	• there are educators who do not have the competence or qualification that complies with the rules in CASR-147	
	HR development in implementation D-3 AMTO program in order to realize the approved D-3 AMTO		
• Barriers to the implementation of the D3 AMTO UNSURYA program	• obstacles are not from the prevailing system but rather come from technical implementation.	• the biggest obstacle lies in the lack of facilities for practice between stakeholders and stakeholders decisions as well as the difficulty / get candidates with the required qualifications.	• Budget is the main factor that can cause the non- realization of the D-3 AMTO UNSURYA which recognized (approved) by DKPPU

Source: Summary of Evaluation Results by Researchers

4.4 Results or Achievements (Product)

The final stage of program evaluation with the CIPP model is evaluating the achievements of this program by looking at the series of program implementations and interpreting the success of its objectives, assessing the data collection obtained, and comparing the criteria set with the results obtained and considering its relation to context, input and process then formulate it rationally. The results or achievements expected from the implementation of the D-3 AMTO at UNSURYA to support the realization of the establishment or establishment of the D-3 AMTO UNSURYA which are recognized as having several main things, namely the results of graduate education, the results of program integration and the results of implementing the program requirements that have been set. DKPPU. The main problems that are used as

the focus in the product stage are as follows; Product administration standardization that is expected to be produced in the evaluation of the AMTO program in the aeronautical engineering diploma study program for the initial stage is the fulfillment of administrative standardization. In this study, according to the results of interviews, what is meant by administrative standardization is the fulfillment of all administrative requirements in accordance with the rules or legal basis for establishing AMTO in CASR Part 147. Administrative standards are said to be fulfilled, if the requirements as mentioned above have been met. In fact, as in the results of the interview, it can be said that in the process of achieving the AMTO program in the D-3 aeronautical engineering program, there are still some that have not been fulfilled, but the data from the questionnaire on the product aspect "achievement of administrative standardization", shows a score of 3 (fairly good). Standardization of administration is very much needed in the process of forming or establishing AMTO because it facilitates initial sorting. In reality, it is known based on the results that the administration is absolutely very concerned about its suitability with the required conditions. And the next Product aspect is "achievement of competency standardization". Competency standardization can be met, of course, cannot be separated from meeting the needs of users, as the results of interviews show that D-3 AMTO UNSURYA really needs personnel (educators) who have expertise in the field of aviation so that they can and are able to work in the field of aviation to fulfill the vision and mission. aeronautical engineering study program. Based on the results of the interview, it is known that at this time it is very difficult to recruit personnel who have an aviation education background or have the ability in the field of aviation because they are constrained by the lack of personnel who have special skills or competencies in the field of aviation. The data from the questionnaire on this Product aspect, shows a weighted value of 2.1 (not good). Competency standards should be absolute values that must be met by HR. To overcome this, human resources must still have a selling point, so they must equip themselves with the skills and competencies that are really needed in accordance with the provisions with the rules or legal basis for establishing AMTO in CASR Part 147 (Civil Aviation Safety Regulations) that apply from the Department of Transportation. Feasibility of the Ministry of Transportation of the Republic of Indonesia. From the results of the analysis of the product aspect, the results of the evaluation can then be summarized in table 6 below.

Table 6: Product Aspect Stages of Conformity Analysis AMTO Program in Aeronautical Engineering Diploma

Stages of the Product Aspect of the Aircraft Maintenance Training Organization Program			
	Description	**Evaluation**	
Objective	**Empirical Data**	**Criteria**	**Decision**
	● compliance with administrative standards	● administrative standards are fulfilled because there is supervision from UNSURYA, GMF and DKPPU	● in the examination of program administration should be more upgraded for standard compliance

●Administration standard			
Objective	**Empirical Data**	**Criteria**	**Decision**
● Competency standardization	● requires personnel who have competent needed	● fulfillment of competence is difficult because of the difficulty of getting personnel with an appropriate background in the field of aviation with the rules or legal basis of AMTO's establishment in CASR Part 147	Cooperation with GMF is continued to fulfill competency standards in accordance with the rules or legal basis of establishment. After that, AMTO was introduced to various courses to increase self-competence.

Source: Summary of Evaluation Results by Researchers

5. Conclusion

Based on the results of this research analysis, it can be concluded that the policy of establishing the AMTO D-3 program is clearly needed for the continuity of the aeronautical engineering study program in general, especially at UNSURYA and for its implementation it has been implemented as the AMTO founding regulations on CASR 147, but in achieving the results it seems that it has not optimal to meet the requirements for establishing AMTO due to several obstacles, such as human resource competence, facilities, low priority in procurement and lack of interest in the aviation world. The results of the evaluation stated that the facilities were the main obstacle in realizing the implementation of the AMTO education and training program which was integrated into the three aeronautical engineering diploma study program which was recognized or ratified and received a certification (approval) from the DKPPU. And the next obstacle is human resources whose competence is related to the rules in the civil aviation law, such as having experience working in civil aircraft maintenance or having an aircraft maintenance engineer license (AMEL). This is the cause of the difficulty of finding educators with criteria that are in accordance with the rules in the aviation law. Because only educators from practitioners who have experience in accordance with these regulations, currently it is very difficult to recruit personnel who have a background in aviation education because many practitioners from the aviation world or aircraft engineers do not want a career in aviation education so that for external recruitment it is very difficult

to add human resources in accordance with competency standards, while for internal recruitment it is constrained by the lack of personnel who have special skills or competencies in the field of aviation.

The results of the evaluation are related to the implementation of the AMTO program requirements. which shows that there are still unfulfilled requirements, it can be concluded that the D-3 AMTO UNSURYA program can be granted permission, after problems or obstacles such as human resources and facilities can be met in accordance with the requirements in CASR-147 regarding the establishment of AMTO. Based on the conclusions from the results of the analysis and discussion in this study, the following are recommended in order to fulfill the requirements for the formation of the D-3 AMTO according to the requirements in CASR-147, as follows; for facilities, especially for practitioners, because they require very large costs, it is better to work with Airline or MRO (Maintenance Repair Organization) and for HR so that this does not happen again in the implementation of aeronautical engineering or aeronautical engineering education programs, educational institutions encounter obstacles in recruiting educators This is because there are no educational institutions that specifically educate teaching staff for aeronautical engineering or aeronautical engineering, including for high school level teachers. The Ministry of Education and Culture of the Republic of Indonesia is expected to play an active role by organizing educational programs for educators for aeronautical engineering or aeronautical engineering programs.

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Sumber lain:

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