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FINANCIAL FEASIBILITY STUDY FOR AERIAL INSPECTION SERVICE PROJECT IN INDONESIA

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ABSTRACT--*In Indonesia, the number of offshore platforms has been growing since the first built in 1969. Nowadays, there are about 613 offshore platforms with various types in Indonesia. It consists of several assets; flare stack, base platform, tower crane, building structure, and telecommunication tower that need to be inspected. As a service company, Applus Velosi introduces a new method for the inspection of offshore platform by using Unmanned Aerial Vehicle (UAV). Since the market of aerial inspection facility for offshore platform is still new, the company have to do a financial feasibility study to organize all necessary details to make a business work, as well as to determine a fair rate for the service charged to the oil and gas company. The objectives of this research were to measure and evaluate the financial feasibility of the project of aerial inspection facility for offshore platform in Indonesia. The research will be anaylzed based on Cost-Volume Profit (CVP) analysis, and financial feasibility analysis which includes break-even analysis, Pay-back Period, Net Present Value (NPV), Internal Rate of Return (IRR), and Weighted Average Cost of Capital (WACC). The project's tolerance will be analyzed by using sensitivity analysis. The research uses quantitaive methods that can be obtained through through company's financial data and historical data. This research limitation was only focused on offshore platform of oil and gas industry in Indonesia. The research finding shows that the project of aerial inspection facility for offshore platform in Indonesia is financially feasible using $800 as a base service rate. The project has positive NPV and IRR is higher than WACC, profitability index is greater than 1, and payback period is around 1 year.*

Keywords-- *CVP Analysis, Financial Feasibility Study, Offshore Platform, Sensitivity Analysis, UAV*

I. INTRODUCTION

In Indonesia, the number of offshore platforms has been growing since the first offshore platform was built in 1969. Nowadays, there are a total approximately 613 offshore platforms with various types in Indonesia. Offshore platform consists of several assets such as flare stack, base platform, tower crane, building structure, and telecommunication tower that need to be inspected. Inspection is useful to identify the problem related to the assets, allowing better preparation of parts and personnel which can reduce the risk of an overrun. However, the inspection task is often risky and costly since oil and gas companies are still using rope access service which needs people to enter the dangerous place to do the inspection. During the inspection work using rope access, the asset has to be shutdown to give people access to enter the area of the asset. The shutdown period can cause big losses since the production stopped during the shutdown period. It took approximately seven days to finish the inspection for each asset. Hence, rope access is not an efficient and effective method to do inspection work (SKK Migas, 2016).

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Applus Velosi was founded in 1982 and began with the name Velosi. The company opened its first office in Kuala Lumpur, Malaysia. Applus Velosi is a group which focused on vendor inspection, certification, third party inspection, testing and manpower services for the oil and gas industry. The company offers global service while considering to meet the local needs. The company provide services from quality assurance to quality control and also handle the manufacturing process from inspection to legislative certification. Applus Velosi offers solutions for the clients in all type of sectors, to ensure that the clients assets and products comply with quality, environmental, health and safety standards and regulations.

As a service company, Applus Velosi introduces a new method which is more efficient and effective for the inspection of offshore platform by using (Unmanned Aerial Vehicle) UAV. Applus Velosi use UAV Falcon 8 which is one of the latest and the most sophisticated UAV at this time. This device is equipped with high definition video equipment, high-resolution still cameras, and thermal imaging cameras. Falcon 8 is able to do a better inspection service in offshore platform compared to conventional rope access services. It provides better safety by removing people from working at height or dangerous area. Besides that, it allows inspection while the asset is live so that it will reduce the length of costly shutdowns. It also provides advanced warning of what needs to be done during shutdown periods for maintenance, allowing advanced preparation of parts and personnel. Falcon 8 is a battery powered UAV, thus it can avoid the need of liquid fuel on site.

Since the market of aerial inspection facility for offshore platform was still new and Applus Velosi was the first company in Indonesia which offered UAV technology to be applied for the inspection of offshore platform, the company gave the free trial for its aerial inspection facility service to Chevron in June 2017 as its marketing strategy. After giving the free trial to Chevron, Chevron gave positive feedback about Applus Velosi aerial inspection facility service. As a result, Chevron decided to use this service for the future inspection since they think it is effective and efficient. Thus, the company planned to commercialize its aerial inspection facility. Therefore, the company need to determine a fair rate for the service of UAV rented facility that should be charged to the clients in order to maximize the profit while attracting other potential clients. Furthermore, the financial feasibility of this project has to be carefully assessed and forecasted.

II. LITERATURE REVIEW

2.1 Basic Principles of Capital Budgeting

The decision of whether to choose and decide new method for the inspection of offshore platform, involves determining the investment rate of return that such the new method will contribute the highest cost efficiency for Applus Velosi. In this study, the use of capital budgeting is important because it creates accountability and measurability.

The capital budgeting model used to analyze data and indicators are Payback Period (PP), Return on Investment (ROI), Net Present Value (NPV), Profitability Index (PI), Discounted Payback Period (DPP), and Internal Rate of Return (IRR).

According to Irawati W and Daryanto W. M (2018), capital budgeting, or investment appraisal, is the planning process used to determine whether an organization's long-term investments such as new machinery, replacement of machinery, new plants, new products, and research development projects are worth the funding of cash through the firm's capitalization structure (debt, equity or retained earnings). It is the process of allocating resources for major capital, or investment, expenditures. Capital budgeting has a rich history and sometimes employs some pretty sophisticated procedures. Fortunately, capital budgeting relies on just a few basic principles. In accordance to Mowen et al. (2017), capital budgeting or the process of making capital investment decisions are concerned with the process of planning, setting goals and priorities, arranging financing, and using certain criteria to select long-term assets. Due to capital investment decisions place large amount of resources at risk for long periods of time and simultaneously affect the future development of the firm, they are among the most important decisions manager make. Each organization has limited resources that should be used to maintain or improve its long-run profitability. Poor capital investment decisions can be disastrous.

Wegandt et al. (2016) illustrates capital budgeting as a process of making capital expenditure decisions in business that involve choosing among various capital projects to fine one(s) that will maximize a company's return on its financial investment. Similary, business make capital expenditures when they modernize plan facilities or expand operations.

III. METHODOLOGY

To accomplish this study, the steps are: (1) Study the terms and conditions of UAV Falcon Systems and apply for calculation of UAV Falcon Project, respectively; (2) Calculate the capital budgeting of the project; the results are: NPV, IRR, Payback Period, Profitability Index, (3) Make decision whether the project is feasible or not; (4) For the feasible projects, the sensitivity analysis is used to analyze how sensitive the NPV towards the changes of other variables involved (service rate, utilization, DSO, and tax rate).

3.1 Variables of Capital Budgeting Model

1) Payback Period (PP)

According to Agitarini D and Daryanto W. M (2018), payback period in capital budgeting refers to the number of years required to recover the original investment in a project. If the payback period is equal to, or only slightly less than, the economic life of the project, then the proposal is clearly unacceptable. If the payback period is considerably less than the economic life, then the project begins to look attractive. The payback period may also be used as an indicator of project liquidity. Project with shorter payback period give an organization more flexibility because fund for another projects become available sooner. The formula is as follows:

$$PP = Years\ full\ recovery + \frac{Unrecovered\ cost\ at\ beginning\ of\ last\ year}{Cash\ Flow\ in\ Following\ Year}$$

2) Return on Investment (ROI)

Return on Investment (ROI) is the most common profitability ratio because of its versatility and simplicity. The calculation is not complicated, relatively easy to interpret, and has a range of applications. To calculate ROI, the benefit (or return) of an investment is divided by the cost of the investment. The result is expressed as a percentage or a ratio. If an investment's ROI is not positive, or if other opportunities with higher ROIs are available, these signals can help investors eliminate or select the best options (Merzi A.M and Daryanto W. M, 2018). The formula is as follows:

$$ROI = \frac{Accounting\ Profit}{Initial\ Investment} x\ 100\%$$

IV. NET PRESENT VALUE (NPV)

Based on Daryanto and Primadona (2018), NPV has calculated by multiply the cash inflow for each year by the present value of $1 for that year at the appropriate rate of return. Perform a net present value calculation essentially requires calculating the difference between the project cost (cash outflows) and cash flows generated by that project (cash inflows). The rate at which the cash inflows are discounted is called the required rate of return, the discount rate, or the hurdle rate (Daryanto, 2018). The different between the present value of the cash inflows and the amount of investment is called the net present value (NPV). If the NPV is non-negative amount, the proposal is acceptable. The formula is as follows:

$$NPV = \sum Discount\ Factor\ x\ Net\ Cash\ Flow$$

t = Time when cash inflow or cash outflow is disbursed.
It is assumed that all cash is disbursed at the end of the year.

3) Profitability Index (PI)

According to Mentari D. and Daryanto W. M. (2018), profitability Index (PI) attempts to identify the relationship between the costs and benefits of a proposed project. The profitability index is calculated by dividing the present value (NPV) of the project's future cash flows by the initial investment. A PI greater than 1.0 indicates that profitability is positive, while a PI of less than 1.0 indicates that the project will lose money. As values on the profitability index increase, so does the financial attractiveness of the proposed projects. The preference rule is: The higher the profitability index, the better the project. The formula is as follows:

$$\frac{NPV}{Initial\ Investment} x100\%$$

PI = Profitability Index NPV = Net Present Value

Discounted Payback Period (DPP)

Discounted Payback Period is the amount of time that it takes (in years) for the initial cost of a project to equal to discounted value of expected cash flows, or the time it takes to break even from an investment. It is the period in which the cumulative net present value of a project equals zero (Arifin M. A and Daryanto W. M, 2018). A more useful and more valid from the payback period is the discounted payback period. In this method, the present value of each year's cash inflows is found, and these are cumulated year by year until they equal or exceed the amount of investment. The year in which this happens is the discounted payback period. A discounted payback period of five years means that the total cash inflows over a five-year period will be large enough to recover the investment and to provide the required return on investment. If the decision maker believes that the economic life will be at least this long, then the proposal is acceptable. The formula is as follows:

$$DPP = Year\ before\ the\ DPP\ period\ occurs - \frac{Cumulative\ cash\ flow\ in\ year\ before\ recovery}{Discounted\ cash\ flow\ in\ year\ after\ recovery}$$

4) *Internal Rate Of Return (IRR)*

Internal Rate of Return (IRR) is a method of calculating rate of return. The rate or discount factor that makes NPV equal zero is called the IRR (Daryanto, 2018). The term internal refers to the fact that its calculation does not involve external factors, such as inflation or the cost of capital. The higher the IRR, the better the project. When the NPV method is used, the required rate of return must be selected in advance of making the calculations because this rate is used to discount the cashflows in each year. As already pointed out, the choice of an appropriate rate of return is a difficult matter. The Internal Rate of Return (IRR) method avoids this difficulty. It computes the rate of return that equates the present value of the cash inflows with the present value of the investment-the rate that make the NPV equal zero. This rate is called the internal rate of return, or the discounted cash flow (DCF) rate of return. The formula is as follows:

$$IRR = iNPV\ Positive + \frac{NPV\ Positive}{(NPV\ Positive - NPV\ Negative}$$

5) *Weight Average Cost of Capital (WACC)*

WACC is the minimum acceptable return a company should earn on any investment that it makes. It reflects the expected average future cost of capital over the long run, determined by weighing the cost of each specific type of capital by its proportion in the company's capital structure (Gitman & Zutter, 2015).

6) *Sensitivity Analysis*

According to Gafli G. F. M and Daryanto W. M (2019), sensitivity analysis is described as a technique for investigating the impact of changes in project variable on the base-case (most probable outcome scenario). The purpose of the sensitivity analysis are 1) Help to identify the key variables which influence the project cost and benefit stream.; 2) Help investigate the impact on project key variables (e.g. IRR); 3) Help asses whether the project decision are likely to be affected by such changes.; 4) Identify the preventive action which could mitigate possible negative effect on the project.

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V. RESULT AND DISCUSSION

4.1 Technical Analysis

Applus aerial inspection service uses the latest and most proven UAV Falcon 8 equipped with video payloads include high definition video equipment, high-resolution still cameras and thermal imaging cameras as shown in Figure 1. Broad range of services may be performed by Applus Velosi aerial inspection service. Technically, special inspection services can be tailored based on client needs.

Figure 1: UAV Falcon (Source: Applus Velosi, 2017)

Subsequent flight will be determined by the findings of the previous flight but where possible the UAV will be flown with the sun behind for optimum photographs and thermal imagery. This mean that the flight path will be determined by the location of the sun and the UAV will follow the path of the sun around the structure to close proximity of suspect the sun moves from East to West during the day. Detailed flight path example for flare stack inspection is illustrated by Figure 2.

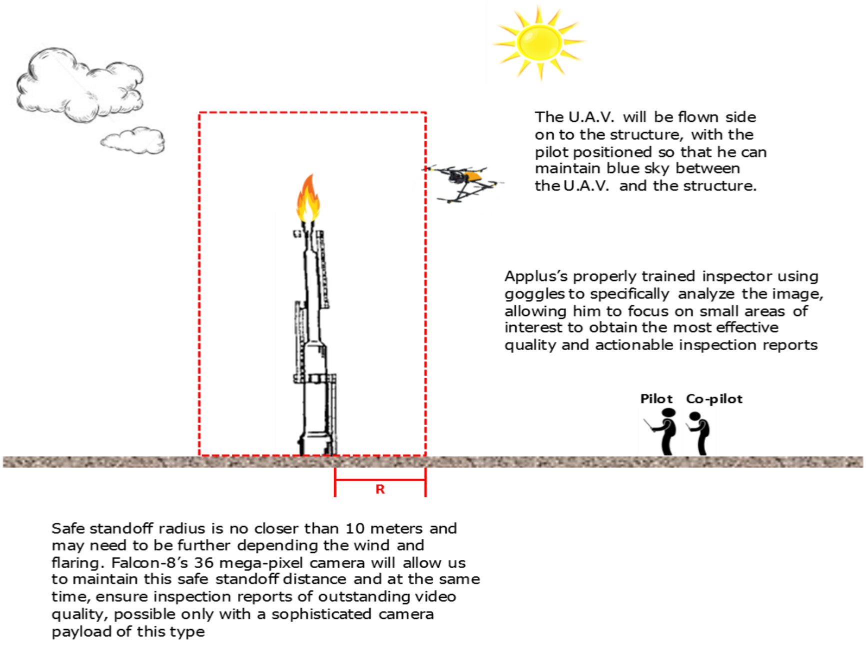

Figure 2: Flight Path Illustration for Flare Stack Inspection (Source: Applus Velosi, 2017)

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The result of the inspection will be delivered by photograph, thermal imagery, and video. The example of the result is illustrated in the Figure 3.

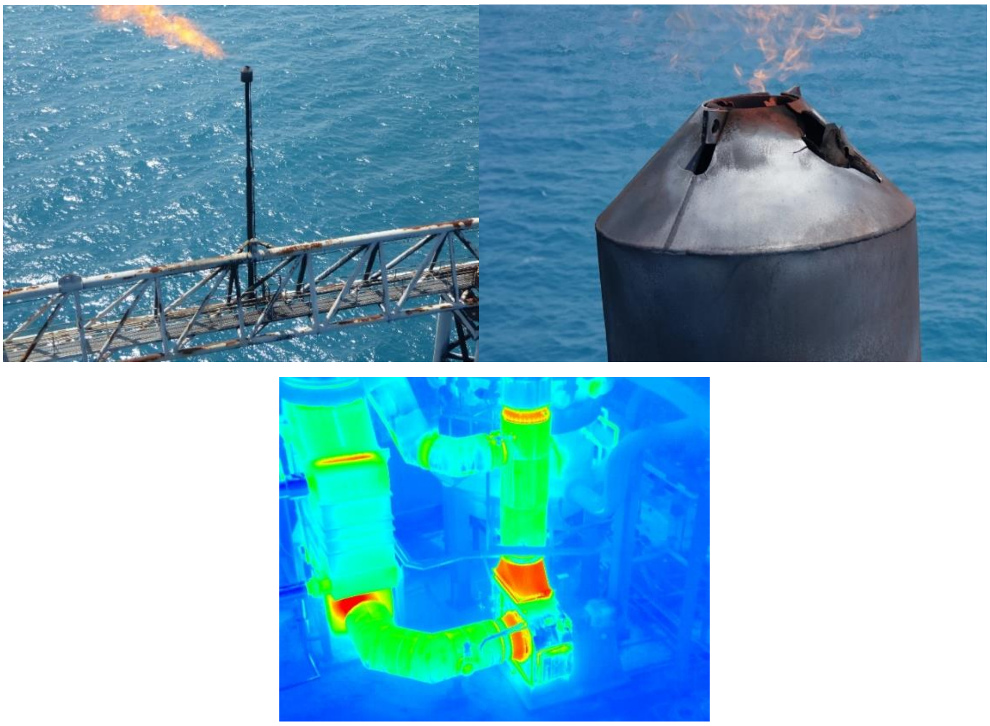

Figure 3: The Result of the Inspection (Source: Applus Velosi, 2017)

4.2 Investment Cost Analysis

Investment cost analysis will discuss about the cost related to the service. There are several assumptions used in this investment cost analysis for the base scenario. First, the duration of the project will be determined by the economic life of the UAV which is three years. This assumption is made by the Applus Velosi UAV pilot experience. Second, the exchange rate of the USD used is based on september 2017 rate which is Rp. 13,328. Third, based on the target market which is 20 percent from the total offshore platform in Indonesia that is over 20 years, the utilization of the service is assumed to approach 70 percent from the total days in three years of the project duration which is 756 days.

The cost related to the aerial inspection service project will be classified into fixed cost and variable cost. Fixed cost consists of the cost related to UAV Falcon 8, operator and inspector salary, and insurance. Cost overrun is also added to the fixed cost for unexpected costs. Meanwhile, variable cost consists of the cost related to the operation of aerial inspection service whis is based on the operation hour of the devices. The detail of the fixed cost and variable cost of the Applus Velosi aerial inspection service can be described in Table 1 and Table 2.

Table 1: Fixed Cost of Aerial Inspection Service Project

Description	Quantity	Cost / Unit (USD)	Cost (USD)	Cost (IDR)	Tax and other cost (IDR)	Total Cost (IDR)	Total Cost ($)
Falcon 8 Inspection Pro Package (Unit)	1	56,450	56,450	752,365,600	127,395,860	879,761,460	66,009
Video Payload						0	
Digital Sony Alpha 7R (Unit)	1	10,470	10,470	139,544,160	0	139,544,160	10,470
Survey Package (Unit)	1	6,660	6,660	88,764,480	0	88,764,480	6,660
Camcorder Sony HDR-PJ810E (Unit)	1	5,330	5,330	71,038,240	0	71,038,240	5,330
	1	1,000	1,000	13,328,000	0	13,328,000	1,000
Battery PP 6250 (Unit)	1	290	290	3,865,120	0	3,865,120	290
Falcon 8 Training	1	2,000	2,000	26,656,000	0	26,656,000	2,000
Shipping Cost	1	450	450	5,997,600	0	5,997,600	450
Operator Salary (Monthly)	36	2,015	72,524	966,603,536	0	966,603,536	72,524
Inspector Salary (Monthly)	36	2,872	103,396	1,378,058,124	0	1,378,058,124	103,396
Personal Protective Equipment (Unit)	6	188	1,125	15,000,000	0	15,000,000	1,125
Battery for Drone (Unit)	60	290	17,400	231,907,200	0	231,907,200	17,400
Insurance for 3 years							
quipment & Earthquake Insurance (Annually)	3	2,005	6,015	80,167,920	0	80,167,920	6,015
Public Liability Insurance (Annually)	3	1,000	3,000	39,984,000	0	39,984,000	3,000
					Cost Overrun (1%)	39,406,758	2,957
					Total Fixed Cost	3,980,082,598	298,626

Source: Applus Velosi, 2017

Table 2: Variable Cost of Aerial Inspection Service Project

Description	Quantity	Cost / Unit (USD)	Cost (USD)	Cost (IDR)	Tax and other cost (IDR)	Total Cost (IDR)	Total Cost ($)
Maintenance (in 100 hours flight)	45	100	4,536	60,455,808	0	60,455,808	4,536
Consumable (in 100 hours flight)	45	20	907	12,091,162	0	12,091,162	907
					Total Variable Cost	72,546,970	5,443

Source: Applus Velosi, 2017

As the table shown above, total fixed cost is \$298,626 and total variable cost is \$5443, thus the total cost of the aerial inspection project is \$304,069. The calculation of variable cost is based on utilization days divided by 100 flight hours, thus higher utilization days means higher maintenance and consumable cost. Thus, the variable cost per unit day is acquired whics is \$7.2 / unit day.

Since all Applus Velosi Indonesia fund was coming from equity, the WACC only consist of cost of equity. Therefore, the proportion of cost of equity is 100 percent from WACC. Cost of equity consist of levered beta, equity risk premium, and risk free. Applus Velosi levered beta is 0.85 (reuters.com).

Based on the country credit ratings, Indonesia's market risk premium amounts to 8.82 percent (Damodaran, 2017). Risk free will be calculated according to BI rate on July 2016 which is 6.5 percent (bi.go.id, 2017). Thus, the WACC can be calculated as follows:

$$WACC = k_e = 6.5\% + [0.85 \times 8.82\%] = 13.997\%$$

4.3 Cost-Volume-Profit (CVP) Analysis

According to the investment cost analysis, there are several assumptions used for the base scenario of Applus Velosi aerial inspection project. The assumptions for the base scenario can be described as table below.

Table 3: Base Assumption

Economic Life (Years)	3
Economic Life (month)	36
Expected Client Utilization (%)	70%
Utilization (days)	756
Exchange Rate USD to IDR	13,328

Source: Author Analysis, 2017

In order to make investment analysis, base scenario for the service rate need to be determined. The base rate of aerial inspection service is calculated based on investment cost and the rate of conventional rope acess service charge which is Rp. 9,000,000 / day or $675 / day. As discussed in investment cost analysis for the base scenario, the total cost of the project is $304,069 that consists of fixed cost and variable cost. If the total cost of the project is divided by utilization days which is 756 days, the cost per day can be obtained which is $402.21 / day. For CVP analysis, $800 will be used as the base service rate as this amount is above the average cost per day and approach the service rate of conventional rope access service. The calculation of the base scenario using CVP analysis can be formulated as the table below.

Table 4: CVP Model Analysis for Base Service Rate

	Base Scenario Utilization 70 % & Rate $800
Variable Values	
Sales Price Per Unit ($)	800
Variable Cost Per Unit ($)	7.2
Fixed Costs ($)	298,626
Volume of Sales (Unit Day)	756
CVP Model Results	
Sales ($)	604,800
Variable Costs ($)	5,443
Contribution Margin ($)	599,357
Fixed Costs ($)	298,626
Operating Profit ($)	**300,731**
Net Profit Margin (%)	49.72%

Source: Author Analysis, 2017

As the table 4. shown above, the base assumption with $800 service rate generates $300,731 operating profit as well as 49.72 percent net profit margin within 3 years. This rate is still higher than the rate of conventional rope access service which is $675.

However, if the rate is calculated based on the rate per asset where aerial inspection service only required 2 days / asset while conventional rope access service required 7 days / asset, the base scenario is cheaper. Conventional rope access service cost oil and gas company $4725 / asset while the base scenario only cost $1600 / asset.

In the linear Cost-Volume-Profit Analysis model (where marginal costs and marginal revenues are constant, among other assumptions), the break-even point (BEP) (in terms of Unit Sales (X)) can be directly computed in terms of Total Revenue (TR) and Total Costs (TC) as:

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$$X = \frac{TFC}{P - V}$$

In base scenario, the rate $800 required 377 unit days of service in order to reach break even point. Once the number of unit days surpass the break-even point, the company can start making a profit. The graph of break even analysis can be seen as the Figure 4.

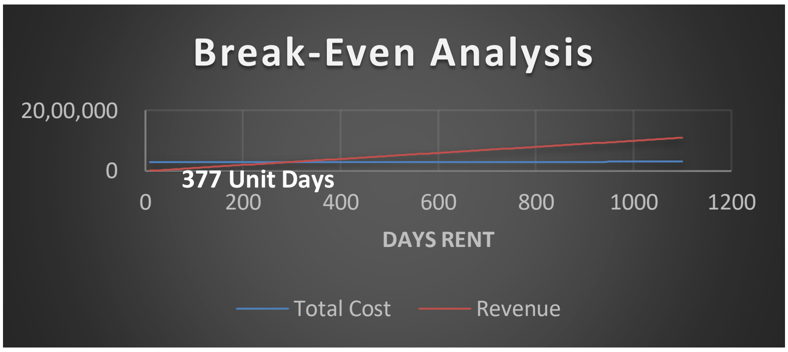

Figure 4: Break Even Analysis for the base service rate $800
(Source: Source: Author Analysis, 2017)

4.4 Income Statement Projection

Based on previous assumption and calculation, the income statement projection for the base scenario can be calculated as the table below.

Table 5: Income Statement Projection for Service Rate $800

Service Charged $800 / day						
	Year 1		Year 2		Year 3	
	S1	S2	S1	S2	S1	S2
Revenue						
Growth (%)	N/A	5%	5%	5%	5%	5%
Revenue (Unit Days)	111	117	123	129	135	142
Revenue ($)	88,916	93,362	98,030	102,932	108,078	113,482
Expenses						
Depreciation Expense for Falcon 8 ($)	18,817	12,544	8,363	5,575	3,717	2,478
Depreciation Expense for Video Payload ($)	5,600	3,733	2,489	1,659	1,106	737
Drone Battery ($)	3,770	3,770	3,770	3,770	3,770	3,770
Maintenance Expense ($)	667	700	735	772	811	851
Consumable Expenses ($)	133	140	147	154	162	170
Insurance Expense ($)	1,503	1,503	1,503	1,503	1,503	1,503
Wage Expense - Operator Salary ($)	12,087	12,087	12,087	12,087	12,087	12,087
Wage Expense - Inspector Salary ($)	17,233	17,233	17,233	17,233	17,233	17,233
Personal Protective Equipment Expense ($)	94	94	94	94	94	94
EBIT ($)	29,013	41,558	51,610	60,084	67,596	74,559
Tax ($)	(7,253)	(10,389)	(12,902)	(15,021)	(16,899)	(18,640)
Interest ($)	-	-	-	-	-	-
Net Income ($)	21,760	31,168	38,707	45,063	50,697	55,919

Source: Author Analysis, 2017

The revenue is assumed to grow five percent for each semester and the tax for the service is assumed 25 percent from the amount of earnings before income tax (EBIT). This scenario generates positive net income in all semester.

After analyzing the cost related to the project and the benefit that company will get within 3 years of service, Cost Benefit Analysis (CBA) can be conducted. Using this analysis, the company can determine whether the proposed project is worthwhile of a company.

Table 6: Cost Benefit Analysis

		Current Year (CY)	CY +1	CY +2	CY +3
Costs					
1	Falcon 8 Inspection Pro Package (Unit)	$ 56,450			
2	Video Payload	$ 23,750			
3	Falcon 8 Training	$ 2,000			
4	Shipping Cost	$ 450			
5	Operator Salary		$ 24,180	$ 24,180	$ 24,180
6	Inspector Salary		$ 34,464	$ 34,464	$ 34,464
7	Personal Protective Equipment	$ 376	$ 376	$ 376	
8	Drone Battery	$ 5,800	$ 5,800	$ 5,800	
9	Insurance	$ 3,005	$ 3,005	$ 3,005	
10	Maintenance and Consumable		$ 1,641	$ 1,809	$ 1,994
Total Costs (Future Value)		$ 91,831	$ 69,466	$ 69,634	$ 60,638
Total Costs (Present Value)		**$ 91,831**	**$ 60,935**	**$ 53,581**	**$ 40,929**
Benefits					
1	Service Fee		$182,278.00	$200,962.00	$221,560.00
Total Benefits (Future Value)		$ -	$182,278.00	$200,962.00	$221,560.00
Total Benefits (Present Value)		**$ -**	**$159,892.98**	**$154,633.73**	**$149,546.69**

Total PV Benefits	$ 464,073
Total PV Costs	$ 247,276
NET BENEFIT	**$ 216,797**

Source: Author Analysis, 201

4.5 Cash Flow Projection

According to historical data of the company, the collection days or day's receivable or Days Sales Outstanding (DSO) is assumed 45 days for the base scenario. Hence, the calculation of account receivable for each semester follow the equation below.

$$\text{Account Receivable in the Semester} = \frac{(\text{DSO x Revenue in the Semester})}{\text{Total Days in the Semester}}$$

Based on the assumption above, the cash flow projection for the base scenario can be calculated as the table below.

Table 7: Cash Flow Projection for Service Rate $800

	Year 0	Year 1		Year 2		Year 3	
		S1	S2	S1	S2	S1	S2
EBIT		29,013	41,558	51,610	60,084	67,596	74,559
(+) Depreciation ($)		28,187	20,048	14,622	11,005	8,593	6,985
Working Capital							
(-)Account Receivable ($)	0	21,925	23,021	24,172	25,380	26,649	27,982
Working Capital Movement ($)		(21,925)	(1,096)	(1,151)	(1,209)	(1,269)	(1,332)
Operating Cash flow ($)		**35,275**	**60,509**	**65,080**	**69,880**	**74,920**	**80,212**
Tax ($)		(7,253)	(10,389)	(12,902)	(15,021)	(16,899)	(18,640)
Cashflow		**28,022**	**50,120**	**52,178**	**54,859**	**58,021**	**61,572**
Investment ($)	(82,650)	-	-	-	-	-	-
Cashflow After investment ($)	**(82,650)**	**28,022**	**50,120**	**52,178**	**54,859**	**58,021**	**61,572**

Source: Author Analysis, 2017

4.6 Financial Feasibility Analysis

According to the income statement projection and cash flow projection, the financial feasibility of Applus Velosi aerial inspection project can be determined by using capital budgeting model indicators. The indicator of capital budgeting model includes Weighted Average Cost of Capital (WACC), Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index (PI), Payback Period (PP), and Return On Investment (ROI).

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The result of capital budegeting model calculation for base scenario can be seen as the Table 8 below.

Table 8: The Result of Financial Feasibility Analysis for Service Rate $800

	Base Scenario Utilization 70 % & Rate $800
Variable Values	
Sales Price Per Unit ($)	800
Variable Cost Per Unit ($)	7.2
Fixed Costs ($)	298,626
Volume of Sales (Unit Day)	756
CVP Model Results	
Sales ($)	604,800
Variable Costs ($)	5,443
Contribution Margin ($)	599,357
Fixed Costs ($)	298,626
Operating Profit ($)	**300,731**
Net Profit Margin (%)	49.72%
WACC	13.997%
IRR	97.33%
NPV ($)	148,992
Profitability Index	2.80
Payback Period (years)	1.04
Return On Investment	294.39%
Breakeven Point (Unit Days)	377

(Source: Author Analysis, 2017)

According to the Table 8, the financial feasibility of the aerial inspection project using base service rate $800 is financially feasible. This scenario has positive NPV which are $148,992 for rate $800. The IRR which is 97.33 percent is also higher than WACC which indicates the project is acceptable. Profitability index for this scenario is also higher than 1 which means the future anticipated discounted cash inflows of the project are greater than the anticipated discounted cash outflows. Payback period for both scenarios is about 1 year. This base scenario will generate 294.39 % ROI and required 377 days of service to reach breakeven point.

4.7 Sensitivity Analysis

Sensitivity analysis will be used to see the project's financial feasibility result under different variables change. The project's financial feasibility result will be tested with the change of several variable in the upside and downside scenario. Sensitivity analysis will see the impact of each variable change to the financial feasibility indicator. The financial feasibility indicators that will be tested are NPV, IRR, and Profitability Index.

4.7.1 Change of Various Variables to NPV

The result of various variables change to NPV can be seen as the table and figure below.

Table 9: Summary of Variables Change to NPV

Variables	-20%	-10%	0%	10%	20%
Service Rate ($)	84,130	116,561	148,992	181,423	213,853
Utilization (%)	84,757	116,874	148,992	181,109	213,227
DSO (Days)	153,745	151,368	148,992	146,615	144,238
WACC (%)	161,158	154,941	148,992	143,259	137,767
Tax Rate ($)	161,182	155,087	148,992	142,896	136,801

Source: Author Analysis, 2017

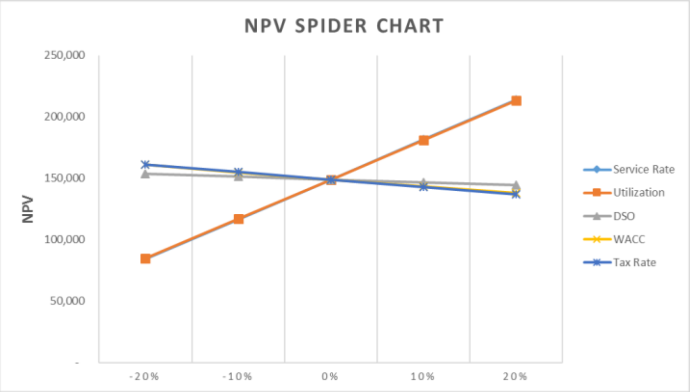

Figure 5: NPV Spider Chart (Source: Author Analysis, 2017)

Based on the result of various variables change to NPV, the most sensitive variables are service rate and utilization days since those variables generates highest gradient on the chart above.

It indicates that this project financial feasibility relies heavily on service rate and utilization days so that the company should maximize these variables.

4.7.2 Change of Various Variables to IRR

The result of various variables change to IRR can be seen as the table and figure below.

Table 10: Summary of Variables Change to IRR

Variables	-20%	-10%	0%	10%	20%
Service Rate ($)	63.56%	80.74%	97.33%	113.47%	129.26%
Utilization (%)	63.91%	80.91%	97.33%	113.31%	128.95%
DSO (Days)	100.88%	99.10%	97.33%	95.58%	93.84%
WACC (%)	97.33%	97.33%	97.33%	97.33%	97.33%
Tax Rate ($)	103.08%	100.22%	97.33%	94.42%	91.49%

Source: Author Analysis, 2017

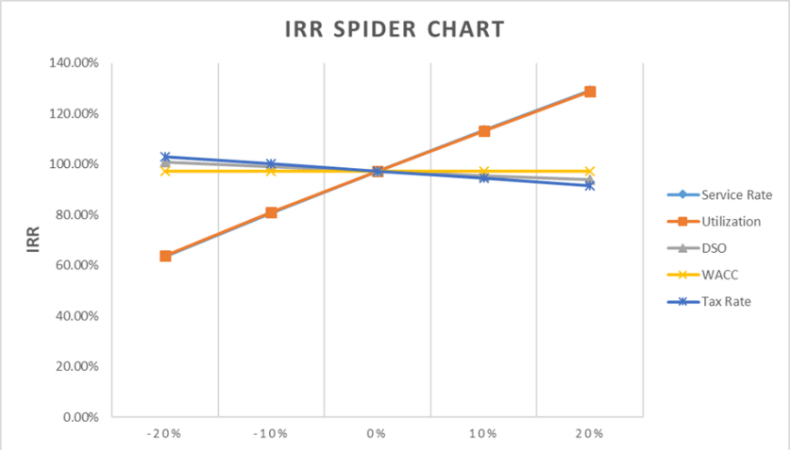

Figure 6: IRR Spider Chart (Source: Author Analysis, 2017)

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The above data shows that the service rate and utilization days also have the highest gradient which indicates that those have the biggest impact to the IRR result. The change of utilization and service rate percentage shows nearly similar result in IRR.

4.7.3 Change of Various Variables to Profitability Index

The result of various variables change to IRR can be seen as the table and figure below.

Table 11: Summary of Variables Change to Profitability Index

Variables	-20%	-10%	0%	10%	20%
Service Rate ($)	2.018	2.410	2.800	3.195	3.587
Utilization (%)	2.025	2.414	2.800	3.191	3.580
DSO (Days)	2.860	2.831	2.800	2.774	2.745
WACC (%)	2.950	2.875	2.800	2.733	2.667
Tax Rate ($)	2.950	2.876	2.800	2.729	2.655

Source: Author Analysis, 2017

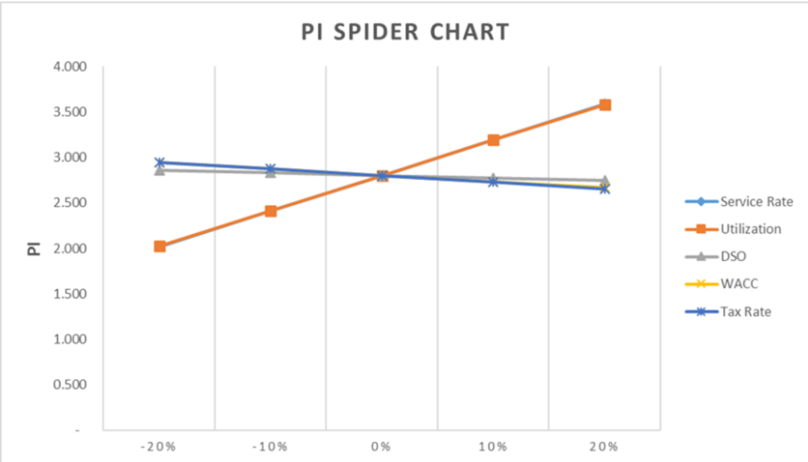

Figure 7: Profitability Index Spider Chart (Source: Author Analysis, 2017)

Based on the result above, Profitability Index is also got affected mostly by service rate and utilization days since those also generate highest gradient on the chart above. The change of service rate and utilization days also generate nearly similar result to profitability index.

VI. CONCLUSION AND RECOMMENDATION

Based on the analysis that has been made in the previous chapter, it can be concluded that Applus Velosi aerial inspection project for offshore platform in Indonesia is financially feasible. For the base assumption, the service rate $800/day is used as this amount is above the average cost per day and approach the service rate of conventional rope access service. This rate is also very attractive to the clients since the service fee for each asset become much lower than the conventional rope access service which is the current service that used for inspection. For each asset using aerial inspection service, the clients only have to spend 2 days with service rate $800/day or equal to $1600.

Meanwhile, the rope access service cost $675/day with 7 days of service or equal to $3375 for each asset. It excludes the advantage of loss reduction since the inspection can be done while the asset is live and it has lower risk.

Using base assumption, the project is acceptable with NPV resulted from the project reaches $148,992 which is greater than zero. The IRR of the project which is 97.33% is also greater than WACC which is only 14%. The profitability Index of the project which is 2.80 is also greater than 1, with payback period is within 1.04 year. This project is also expected to get 294.39% ROI. In accordance to sensitivity analysis, service rate and utilization days are the most sensitive variables. These variable have the biggest impact to the financial feasibility result: NPV, IRR, and Profitability Index (PI). The change of service rate and utilization days generate nearly similar result to NPV, IRR, and Profitability Index (PI).

For the recommendation, service rate $800 can be used as the most preferable rate or basic rate for the service. However, this rate can be changed following the market condition. The service rate also need to consider utilization days which based on the working contract with the clients. Higher utilization days means the company can lower the service rate while maintaining the profit. The company’s perfomance can also be improved by lowering the days’ receivable or Days Sales Outstanding (DSO) which make project’s cash flow better.

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