Paper 82

Decision-Making Process in Developing A “Quick Win” Program to Increase Oil Production in PHE Subholding Upstream

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Abstract - **Throughout 2021, PT PHE as an Subholding Upstream, faced the issue of unachieveable drilling well target with the realization only 88.4% of the YTD RKAP Revisi target, and 84% of the RKAP Revisi target that were successfully onstream. This issue has an impact on the oil production target from August to December 2021 where the total realization of oil production up to Q4 in 2021 was 88.2% of the oil production target.**

This study aims to select and determine the decision-making process in order to find a solution to the issue of decreasing oil production volume in the Subholding Upstream, especially in Regional 2 area and determine proposed wells that are easy to execute as the main guide in developing the Quick Win Program in Subholding Upstream.

The results of calculations using the Weight Sum Model method in the form of alternative rankings in the Regional 2 and from the calculation with the DTA method, the Quick Win Program simulation showed an increase in production compared to the original case in forecasted production profile of the RKAP 2023 development wells.

Keywords – **Weighted Sum Model, Decision Tree Analysis, Quick Win Program**

I. INTRODUCTION

The production of oil and gas fields in Indonesia and especially in Pertamina's work areas has passed the peak period of production and is now entering a phase of natural production decline since the last 10 years. The downward trend in oil and gas lifting is mainly due to the large number of old oil wells, characterized by the beginning of a natural decline in production as can be seen from the increasingly high-water content in the reservoir. With various efforts made by the company, such as exploration activities and intensive new field discovery efforts, replenishment of reserves, optimization of production, reliability of production facilities, efficiency and technological innovation, it is hoped that the decline in production can be restrained.

PT Pertamina continues to strengthen its commitment to achieve the company's vision and mission in the context of transformation into a global company with a target market value of $100 billion by 2024 while continuing the main agenda of the energy transition going forward. The transformation within the company itself through the restructuring of Holding and Subholding has been going on since mid-July 2020. Pertamina now has a very strategic role in overseeing five sub-holdings engaged in energy, i.e., Subholding Upstream which is operationally run by PT Pertamina Hulu Energi. PT Pertamina Hulu Energi is assigned to manage the business and operations of upstream business activities within PT Pertamina (Persero) and its subsidiaries and affiliates of PT Pertamina (Persero) within the scope of the Upstream business group, including carrying out upstream business activities regionally by upstream subsidiaries. This research will focus on the Subsurface Development & Reserve Evaluation (SDRE), a strategic organization under the Directorate of Development and Production Subholding Upstream that has a role and responsibility in achieving targets, reliability and sustainability of subsurface development, Enhanced/ Improved Oil Recovery (E/IOR), as well as reserve and resource management.

Throughout 2021, 350 wells have been drilled throughout all Regional or 88.4% (-11.6%) of the YTD RKAP Revisi target. From a total of 350 drilling wells, 294 drilling wells or 84% (-16%) of RKAP Revisi target have been successfully onstream. From the achievement of onstream wells, the oil production target for August to December 2021 has not been achieved.

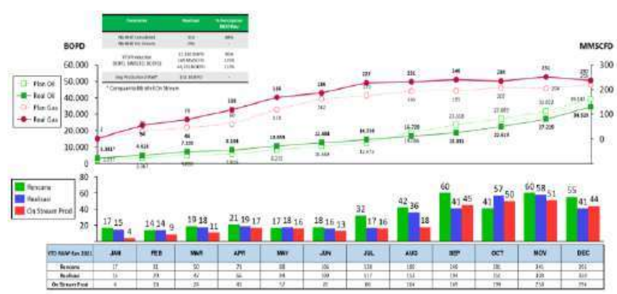

Fig. 1. Production Performance of RK 2021 Development Drilling

The total realization of oil production until Q4 in 2021 was 445.3 MBOEPD or 88.2% (-11.8%) of the oil production target of 504.84 MBOEPD (Figure 1).

II. METHODOLOGY

The conceptual framework is created to describe the main problems that arise in the upstream business processes that must continue to run. The upstream process business also demands the reliability of SDRE in terms of subsurface engineering in carrying out its functions and responsibilities to achieve the production target of development wells in Subholding Upstream. The expected condition is the existence of a Quick Win Program that can increase oil production, through the quality of decision making and project implementation plans that are easy, agile, and reliable (Figure 2).

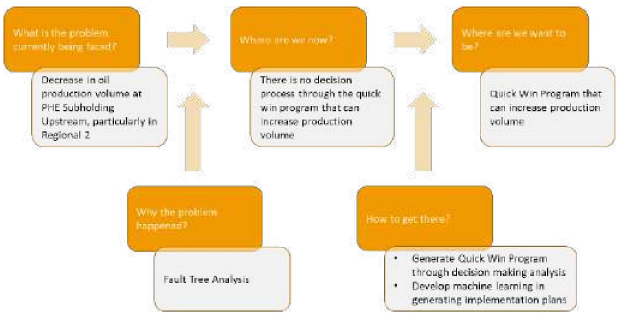

Fig. 2. Conceptual Framework

Several steps are used in answering problems and finding solutions, including:

1. Identifying Main Problems and Analyzing Root Causes: Root Cause was analyzed using the FTA (Fault Tree Analysis) method. Fault Tree Analysis is a top-down deductive analysis in which unwanted systems are analyzed using Boolean logic (Martensen, 1987). From the root cause analysis using FTA, the results of the root causes of the main problems in SDRE are as follows: proposed wells that are not economically viable or economically marginal, subsurface issues during and after drilling, and completion problems. Subsurface issues can be broken down into the following: Dynamic Uncertainty, Structural/Static Uncertainty, Facies Heterogeneity & Reservoir Quality and Completion Issues (Figure 3).

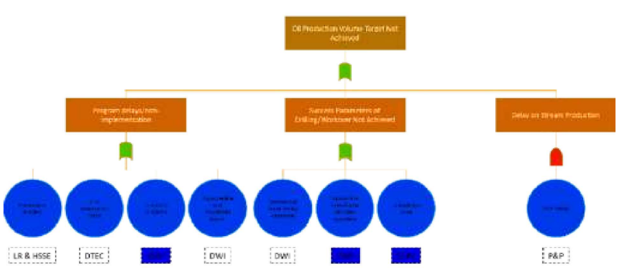

Fig. 3. Fault Tree Analysis of Main Issue

In the FTA tree, the peak events are based on the risk management activities performed by SDRE. Risk management itself is an activity of routine inspection, supervision, and observation as well as determining the status of actual performance compared to the plan that will be produced. Risk management activities themselves have an important role in avoiding or minimizing potential losses, optimizing opportunities and maintaining a conducive environment. The results in the form of the main risks are written in the monitoring report form and reported on a monthly and quarterly basis (Table 1).

Table 1 - EXAMPLE OF TOP RISK DETERMINATION

2. Developing Quick Win Program: Quick Win Program procedure consists of selecting a database structure/oil and gas field as an alternative, determining the defined criteria and sub-criteria, determining the weight of the assessment of each criterion and sub-criteria, appointing experts, calculating the final total of the assessment system, grouping oil and gas fields (alternatives) in 5 categories, ordering proposed wells of RKAP 2023 based on the best alternative, data analysis and simulation of quick win programs, and recommended solutions (Figure 4).

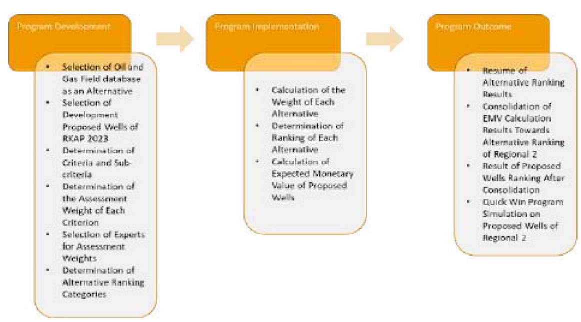

Fig. 4. WSM and DTA Approach in Developing Quick Win Program

In developing Quick Win Program, Weighted Sum Model was chosen because it is the most suitable method among other Multi-Criteria Decision Analysis methods. The consideration is the number of oil and gas fields as alternative that are widely spread in the Regional 2 area with all subsurface data in it. Another consideration that is no less important is all oil and gas fields must be included in the analysis to ensure that all available alternatives remain objective to be assessed by all experts in the SDRE organization. The expert considered that a priority system was needed in the management pattern of the oil and gas field in order to facilitate the allocation of resources, humans, technology, and other supporting facilities.

The calculation begins with preprocesses the data by determining the criteria and sub-criteria that will be used as a reference in making decisions to achieve the desired goals. The determination of the criteria and sub-criteria agreed upon by the forum covers various subsurface techniques, where these aspects are closely related to the domain of SDRE. The criteria are then sorted from highest to lowest based on importance. The criteria used in determining the priority of oil and gas structures/fields are as follows: Resources Assessment, Economic Value, Reservoir Management, Surface – Subsurface Issue, Infrastructure, Structural & Facies Uncertainty, Production, Water Cut, Workplan, IOR/EOR (Figure 5).

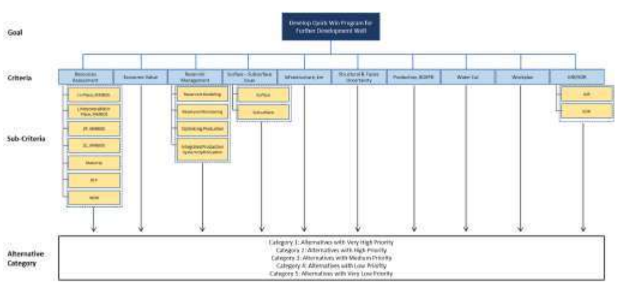

Fig. 5. Alternative Ranking Model

Then, after Weighted Sum Model gives the results, the author presents a simple Value of Information Analysis (VOIA) approach through Decision Tree Analysis. The approach presented here is an additional tool that can be used in the decision-making process. The decision to continue drilling after the funneling/challenge session is determined by evaluating the value of the conceptual model – relative to the cost of the drilling. The Decision Tree Analysis method was also chosen by the author to prioritize the wells to be drilled from the beginning to the end of the year in RKAP 2023, based on each region and the drilling barchart.

Each conceptual model prior to subsequent decisions will have two values to estimate at this point: model reliability and drilling risk (cost of unsuccessful wells). The project will have an Expected Monetary Value (EMV) at initial conditions. The reliability of the model will be determined by defining the drilling success ratio for each region, although this is often considered subjective. To calculate VOI, the Net Present Value of a project is estimated with or without additional activities (Figure 6). NPV is the amount of cash flow from the project evaluated to date with the required rate of return for the investment of the project (White et. al., 1998).

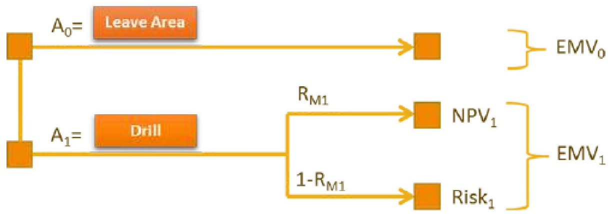

Fig. 6. Decision Tree Model in Quick Win Program Development

3. Implementing Quick Win Program: The implementation of the Quick Win Program is carried out based on the stages of decision-making within the company, starting from the initiation stage, selection stage, further study stage, before finally entering the execution stage (Table 2).

Table 2 - IMPLEMENTATION PLAN SCHEDULE

No	Activities	2022					2023											
		8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1	Initiation stage	■	■															
2	Selection Stage		■	■														
3	Advanced Study Stage			■	■	■												
4	Execution Stage						■	■	■	■	■	■	■	■	■	■	■	

At the initiation stage, coordination is needed in the internal organization of SDRE. The Quick Win program will be presented to each expert to be challenged before being brought to a bigger contest. At the selection stage, external SDRE coordination was carried out, especially with organizations of DWI, P&P, and UBPPM. Here, experts collaborate to select proposed wells to be issued in the Quick Win Program. Justification for the proposed wells that will be issued are wells that have obstacles in both surface and administrative aspects, such as problems with POD/FID approval, land permits, delays in UKL/UPL documents, and vendor and technology contracts. At the further study stage, the FEED is compiled to detail the best development concept until it reaches a certain level of maturity and confidence so that it is suitable for use as decision-making material. Finally, at the execution stage, project planning that was prepared previously is implemented through detailed engineering activities under the DWI and P&P organization by taking into account strict risk and uncertainty management as well as project control and monitoring that follows project management rules.

III. RESULTS

Taking into account the Covid-19 Pandemic when this work was taking place, Focus Group Discussions with experts were conducted. Each expert gives weight one by one to each oil and gas field as alternative (Table 3). As many as 202 oil and gas fields have been assessed, which are divided into 191 developing fields, 2 KSOs, and 9 suspended fields.

Table 3 - EXAMPLE OF WEIGHT ASSESSMENT FOR EACH CRITERION

Alternatives	Criteria/Sub-criteria																			
	Resources Assesment							Economic Value	Reservoir Management				ISSE		Infrastructure	Structural & Facies Uncertainty	Production	Water Cut	WP	IOR/EOR
	In Place Best	Remaining In Place	2P	2C	Maturity	WDR	RTP		Reservoir Modeling	Reservoir Monitoring	Production Optimization	Integrated Production System Optimization	Surface	Subsurface						
Akasia Bagus	1	1	1	3	5	3	4	5	5	5	4	4	4	2	4	4	5	3	5	1
Akasia Besar POP	1	1	1	1	5	1	1	3	3	3	4	3	4	4	4	3	2	2	1	1
Akasia Maju POP	1	1	1	2	5	1	1	3	4	5	4	3	4	5	2	3	2	4	3	1
Arjawinangun	1	1	1	1	1	1	1	1	2	2	1	1	3	4	1	3	1	2	1	1
Bambu Besar	1	1	1	1	5	1	2	4	5	5	5	4	5	4	4	5	5	4	5	1
Bambu Gunung	1	1	1	1	2	1	2	1	5	3	5	4	4	4	4	4	2	2	4	1
Bojong Raong	1	1	1	1	3	1	2	2	3	3	2	2	4	4	5	2	1	2	2	1
Cemara	1	1	1	1	2	2	3	5	4	5	5	4	4	5	4	4	5	2	5	1
Cicauh	1	1	1	1	1	3	4	1	3	3	2	2	4	4	4	4	3	4	2	1
Cikarang	1	1	1	1	4	3	3	2	3	3	2	2	5	5	2	3	1	4	2	1
Cilamaya Selatan A	1	1	1	1	1	1	1	2	3	2	1	2	4	4	3	1	1	1	1	1
Cilamaya Timur	1	1	1	1	1	1	2	2	4	3	3	4	5	4	4	3	1	2	3	1
Cilamaya Utara	1	1	1	1	1	1	2	2	4	5	3	4	5	4	5	4	3	2	3	1

After the experts calculated the weight of the alternative assessments for each criterion, the alternative values were then multiplied by the weights of the criteria and added together to produce a total alternative value (Table 4). Furthermore, each alternative is put into a ranking category according to the total value of each alternative.

Table 4 - EXAMPLE OF RANKING DETERMINATION OF EACH ALTERNATIVE

Alternatives	Criteria										VALUE	RANK
	Resources Assessment	Economic Value	Reservoir Management	ISSE	Infrastructure	Structural & Facies Uncertainty	Production	Water Cut	WP	IOR/EOR		
	Weightage											
	20	20	14	10	8	7	8	5	3	5		
Akasia Bagus	2.45	5	4.5	3	4	4	5	3	5	1	377	Very High
Akasia Besar POP	1.8	3	3.25	4	4	3	2	2	1	1	282.5	Medium
Akasia Maju POP	1.7	3.5	4	4.5	2	3	2	4	3	1	296	High
Arjawinangun	1	1	1.5	3.5	1	3	1	2	1	1	151	Low
Bambu Besar	1.75	4	4.75	4.5	4	5	5	4	5	1	373.5	Very High
Bambu Gunung	1.3	1	4.25	4	4	4	2	2	4	1	252.5	Medium
Bojong Raong	1.45	2	2.5	4	5	2	1	2	2	1	229	Medium
Cemara	1.55	5	4.5	4.5	4	4	5	2	5	1	369	Very High
Cicauh	1.65	1	2.5	4	4	4	3	4	2	1	241	Medium
Cikarang	1.95	2	2.5	5	2	3	1	4	2	1	242	Medium
Cilamaya Selatan A	1	2	2	4	3	1	1	1	1	1	180	Low
Cilamaya Timur	1.15	2	3.5	4.5	4	3	1	2	3	1	246	Medium
Cilamaya Utara	1.15	2	4	4.5	5	4	3	2	3	1	280	High

Based on the decision analysis using the WSM method, the alternative rankings in the Regional 2 with the following summary: 2 fields in the very low priority category (1%), 56 fields in the low category (28%), 95 fields in the medium category (47 %), 37 fields in the high category (18%), and 12 fields in the very high category (6%) (Figure 7).

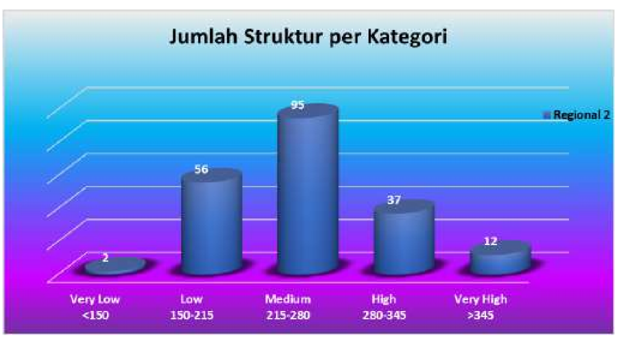

Fig. 7. Percentage of Each Alternative Ranking Category

Oil and gas fields with high and very high category can be interpreted as fields that are prioritized by zones and regions to be developed or are currently being developed, and become the backbone of oil production in Regional 2. Meanwhile, oil and gas fields with moderate to very low category can be interpreted as oil and gas fields that have not been fully exploited (Table 5).

Table 5 - ALTERNATIVE RANKING OF REGIONAL 2

Rank	Zona 5		Zona 6		Zona 7	
	Field	Value	Field	Value	Field	Value
Very High	LL	349	Krisna	349	Subang	347
	KL	349.5			Jatiasri Komplek	365
	ZU	349.5			X-Ray	368
	B3	374.5			Cemara	369
	E Main	394.5			Bambu Besar	373.5
					Akasia Bagus	377
High	E East	281.5	Intan	291	Cilamaya Utara	280
	FC GHU	284.5	Widuri	292	Karang Luhur	280
	FDEM	285.5	NE Intan	311.5	Pondok Makmur	289
	B11	287.5	Cinta	296.5	Akasia Maju	294
	EF	288.5			Karang Enggal	296
	GG	296			Tambun	311.5
	L (PHE)	309			L Parigi	320
	UL	311.5			Melandong	321
	SP	312			Randegan	321.5
	YY	313			Tunggul Maung	322.5
	UX	321			Jatibesar	302.5
	FF	327.5			Gantar	303
	FK	329.5			Pasir Catang	305.5
	BN	302			Karang Baru	308
	K	331			Kayu Merah	332.5
	KLD	340			JBB/Bangadua	342
					Jatibarang	344.5
Medium	AA	215	Lidya	215.5	Jatinegara	221
	FW	216.5	Yvonne UBR	215.5	Karang Baru Barat	236
	KMS	217.5	East Rama	216.5	Tugu Barat C	245
	ME	217.5	Lastri	218	Cilamaya Timur	246
	UC	232	Nadia	218	Sindang	250
	UD	233	Risma	220	Karang Degan	258
	MJ	233.5	Atti	229.5	Tegal Pacing	258
	MV	233.5	Kartini	229.5	MB 47.4%	261
	MB	234	Kitty	232.5	Akasia Besar	262.5
	KLX	245	North Wanda	234.5	Tugu Barat A	263
	MML	249.5	Lita	235.5	Pasir Jadi	265
	KK	250	Gita	247.5	Sindangsari	222.5
	APNA	250.5	Selatan	247.5	Bojong Raong	229
	ES	260.5	Aida	248.5	Pasirjadinaik	229
	UW	260.5	Yani	249	Tanjungsari	237
	OO	262	South Zelda	256.5	Cicauh	241
	UK	263	Zelda, Banuwati	223.5	Cikarang	242
	GQE	221.5	Minor Gas Fields	224.5	Karang Tunggal	244
	JJA	224	Suratmi	227	Pondok Mulia	251.5
	MKN	225.5	Karmila	227.5	Bambu Gunung	252.5
	UB	227	Nora	228.5	Haur Gede	252.5
	LES	229.5	Indri	237.5	Pondok Tengah	253
	UV	236.5	Vita	237.5	Pegaden	268.5
	ESP	239.5	Mila	238		
	EST	240.5	Wanda	238.5		
	APNB	250.5	Sundari	239		
	APND	250.5	SW Wanda	240.5		
	APNE	250.5	Yvonne, BRF/TAF	254		
	APNF	253.5	Farida	254.5		
	KLY	254	Titi	255.5		
	OX	256	Zelda	265		
	FAB	265.5	Banuwati	275		
	UA	266	Rama	277.5		
	YA	268.5				
	UY	271.5				
	FSB	273				
	P	273.5				
	MR	274				
	KKN	275				
Low	NC Java B	161	Savitri	157	Arjawinangun	151
	EWW	176.5	Teresia	196.5	Rengasdengklok N	152
	EWY	176.5	Chesy	199.5	Rengasdengklok O	152
	OY	181.5	Nurbani	209	Pamanukan Selatan	166
	OV	182.5	Asti	211	Pabuaran A	168.5
	NF	183.5	Aryani	211.5	West Gantar	176.5
	BTS	191.5			Pondok Berkah	178.5
	ESR	191.5			Cilamaya Selatan	180
	BZN	193.5			Kandang Haur Barat	181.5
	OQ	194.5			Sukatani	187
	BZZ	195.5			Sambidoyong	188
	FZ	197.5			Haurgeulis	189.5
	FS	199.5			Sindang Turun	191
	AVS	200			Sukamandi	191
	AV	202			Jatirarangon	194
	HZE	202.5			Tegal Taman	194
	APNC	203			Randuwangi	200
	SC	203			Pondok Mekar	200.5
	BLT	207			Jatikeling	207
	OC	208			Kandang Haur Timur	209.5
	FXE	209			Waled Utara	210.5
	FSW	211.5			Rengasdengklok L	213
	OU	212.5				
	UR	212.5				
	SB	213				
	FN	213.5				
	LN	213.5				
	BQ	214.5				
Very Low			Duma	129		
			Retno	134		

Proposed wells of RKAP that have been calculated and produce EMV, are included in each alternative ranking category and sorted by its alternative. Then, after each proposed well is sorted by its alternative, the proposed wells are sorted from high to low EMV values in each alternative ranking category. Proposed wells will be included in the Quick Win Program simulation as an effort to increase oil production at Pertamina (Table 6).

Table 6 - EMV CALCULATION RESULTS TOWARDS ALTERNATIVE RANKING

Zona 5		Zona 6		Zona 7	
Well Proposal	Value	Well Proposal	EMV	Well Proposal	EMV
ZUD-12	3.009	Krisna D-03ST	2.597	BBS-A3	4.253
LLA-5	2.653	Krisna A-15	1.939	ABG-C	2.5
LLD-21	2.093	Krisna C-12ST	0.443	ABG-C1	2.429
LLB-16	1.865	Yvonne-B14	1.085	CMR-STO2	0.003
LLD-20	1.822			MLD-B5	1.778
LLD-22	1.736			CLU-INF1	0.108
ED-14	1.535			HGD-INF1A	1.936
ED-15	1.335			HGD-INF1B	1.563
LLB-14ST	0.846			TTM-A1	0.95
LLE-09	0.068				
FFB-12ST	3.354				
FFB-6ST	1.63				
UXA-9	0.875				
UXA-8	0.637				
MRA-9	4.771				
MRAX-1ST	1.8				
UA-10	3.226				
UA-5ST	2.459				

In presenting the ranking results for proposed wells, mainly there is an onstream date for each proposed well, a monthly decline rate, and a forecast of the average daily oil production rate in each year (Table 7). In the proposed wells ranking, the forecast average rate of production still looks random with the onstream date plan throughout 2023 which is obtained from the UBPPM organization.

Table 7 - PROPOSED WELLS RANKING WITH THE ORIGINAL ONSTREAM DATE PLAN

Zona	Rank	Sumur	Est Qoi	Onstream Date Original	Decline rate	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23
5	1	ZUD-12	330	Feb-23	-22%		330.0	324.0	318.1	312.3	306.6	301.0	295.6	290.2	284.9	279.7	274.6
	2	LLA-5	320	Jan-23	-18%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	287.7	283.4	279.1	274.9	270.8
	3	LLD-21	320	Jul-23	-23%							320.0	313.9	308.0	302.2	296.5	290.8
	4	LLB-16	320	Jan-23	-18%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	287.7	283.4	279.1	274.9	270.8
	5	LLD-20	320	Jul-23	-23%							320.0	313.9	308.0	302.2	296.5	290.8
	6	LLD-22	320	Jul-23	-23%							320.0	313.9	308.0	302.2	296.5	290.8
	7	ED-14	250	Feb-23	-20%		250.0	245.9	241.8	237.8	233.9	230.0	226.2	222.5	218.8	215.2	211.6
	8	ED-15	250	Nov-23	-20%											250.0	245.9
	9	LLB-14ST	306	Jan-23	-30%	306.0	298.5	291.1	284.0	277.0	270.2	263.6	257.1	250.8	244.6	238.6	232.7
	10	LLE-09	320	Jan-23	-33%	320.0	311.3	302.8	294.5	286.5	278.6	271.0	263.6	256.4	249.5	242.6	236.0
	11	FFB-12ST	284.1	Jan-23	-25%	284.1	278.2	272.4	266.7	261.2	255.7	250.4	245.2	240.1	235.1	230.2	225.4
	12	FFB-6ST	193.8	Feb-23	-19%		193.8	190.7	187.6	184.6	181.6	178.7	175.8	173.0	170.2	167.5	164.8
	13	UXA-9	315	Dec-23	-45%												315.0
	14	UXA-8	315	Nov-23	-41%											315.0	304.3
	15	MRA-9	400	2023	-35%							400.0	388.5	377.3	366.5	356.0	345.7
	16	MRAX-1ST	180	2023	-19%							180.0	177.2	174.4	171.6	169.0	166.3
	17	UA-10	515	Apr-23	-19%				515.0	507.0	499.1	491.4	483.7	476.2	468.8	461.5	454.4
	18	UA-5ST	244	May-23	-11%					244.0	241.8	239.6	237.4	235.2	233.1	230.9	228.8
Zona	Rank	Sumur	Est Qoi	Onstream Date Original	Decline rate	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23
6	1	Krisna D-03ST	273	Mar-23	-20%			273.0	268.6	264.2	260.0	255.8	251.6	247.6	243.6	239.6	235.8
	2	Krisna A-15	400	Apr-23	-22%				400.0	392.6	385.4	378.3	371.3	364.4	357.7	351.1	344.6
	3	Krisna C-12ST	300	Mei-23	-21%					300.0	294.8	289.6	284.6	279.6	274.7	269.9	265.2
	4	Yvonne-B14	190	Jul-23	-8%							190.0	188.7	187.5	186.3	185.0	183.8
Zona	Rank	Sumur	Est Qoi	Onstream Date Original	Decline rate	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23
7	1	BBS-A3	31	Jul-23	-7%							31.0	30.8	30.7	30.5	30.3	30.2
	2	ABG-C	300	Apr-23	-23%				300.0	294.3	288.8	283.3	277.9	272.7	267.5	262.4	257.5
	3	ABG-C1	300	Jun-23	-18%						300.0	295.5	291.0	286.6	282.3	278.1	273.9
	4	CMR-STO2	300	Jan-23	-23%	300.0	294.3	288.8	283.3	277.9	272.7	267.5	262.4	257.5	252.6	247.8	243.1
	5	MLD-B5	218	Apr-23	-23%				218.0	213.9	209.8	205.9	202.0	198.1	194.4	190.7	187.1
	6	CLU-INF1	282	Okt-23	-20%										282.0	277.3	272.8
	7	HGD-INF1A	373	Feb-23	-25%		373.0	365.2	357.6	350.2	342.9	335.7	328.7	321.9	315.2	308.6	302.2
	8	HGD-INF1B	375	Dec-22	-47%												375.0
	9	TTM-A1	100	Aug-23	-21%								100.0	98.3	96.6	94.9	93.3
					Regional 2	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23
					Ori Case	1850.1	2959.4	3174.7	4546.7	5005.8	5215.0	6882.4	6856.7	6731.7	6891.1	7331.2	7883.9

Meanwhile, in the Quick Win Program Simulation, the wells are sorted by Onstream Date which has been optimized or prioritized, also based on the availability of rigs in Zona 5, Zona 6, and Zona 7 (Table 8). The description of rig availability is as follows: Rig #1 is operated in Zona 5 and Zona 6; Rig #2 and Rig #3 are operated in Zona 5; Rig #4, Rig #5, and Rig #6 are operated in Zona 7.

Table 8 - QUICK WIN PROGRAM SIMULATION

Zona	Rank	Sumur	Est Qoi	Onstream Date Optimized	Decline rate	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23	Rig	est week drill
5	1	ZUD-12	330	Jan-23	-22%	330.0	324.0	318.1	312.3	306.6	301.0	295.6	290.2	284.9	279.7	274.6	269.6	#1	4
	2	LLA-5	320	Jan-23	-18%	320.0	315.2	310.4	305.7	301.1	296.6	292.1	287.7	283.4	279.1	274.9	270.8	#2	4
	3	LLD-21	320	Jan-23	-23%	320.0	313.9	308.0	302.2	296.5	290.8	285.3	279.9	274.6	269.4	264.3	259.3	#3	4
	4	LLB-16	320	Feb-23	-18%		320.0	315.2	310.4	305.7	301.1	296.6	292.1	287.7	283.4	279.1	274.9	#1	4
	5	LLD-20	320	Feb-23	-23%		320.0	313.9	308.0	302.2	296.5	290.8	285.3	279.9	274.6	269.4	264.3	#2	4
	6	LLD-22	320	Feb-23	-23%		320.0	313.9	308.0	302.2	296.5	290.8	285.3	279.9	274.6	269.4	264.3	#3	4
	7	ED-14	250	Mar-23	-20%			250.0	245.9	241.8	237.8	233.9	230.0	226.2	222.5	218.8	215.2	#1	4
	8	ED-15	250	Mar-23	-20%			250.0	245.9	241.8	237.8	233.9	230.0	226.2	222.5	218.8	215.2	#2	4
	9	LLB-14ST	306	Mar-23	-30%			306.0	298.5	291.1	284.0	277.0	270.2	263.6	257.1	250.8	244.6	#3	4
	10	LLE-09	320	Apr-23	-33%				320.0	311.3	302.8	294.5	286.5	278.6	271.0	263.6	256.4	#1	4
	11	FFB-12ST	284.1	Apr-23	-25%				284.1	278.2	272.4	266.7	261.2	255.7	250.4	245.2	240.1	#2	4
	12	FFB-6ST	193.8	Apr-23	-19%				193.8	190.7	187.6	184.6	181.6	178.7	175.8	173.0	170.2	#3	4
	13	UXA-9	315	May-23	-45%					315.0	303.5	292.4	281.7	271.4	261.4	251.9	242.7	#1	5
	14	UXA-8	315	May-23	-41%					315.0	304.3	294.0	284.1	274.5	265.2	256.2	247.5	#2	5
	15	MRA-9	400	May-23	-35%					400.0	388.5	377.3	366.5	356.0	345.7	335.8	326.1	#3	4
	16	MRAX-1ST	180	Jun-23	-19%						180.0	177.2	174.4	171.6	169.0	166.3	163.7	#1	4
	17	UA-10	515	Jun-23	-19%						515.0	507.0	499.1	491.4	483.7	476.2	468.8	#2	4
	18	UA-5ST	244	Jun-23	-11%						244.0	241.8	239.6	237.4	235.2	233.1	230.9	#3	4
Zona	Rank	Sumur	Est Qoi	Onstream Date	Decline rate	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23	Rig	est week drill
6	1	Krisna D-03ST	273	Aug-23	-20%								273.0	268.6	264.2	260.0	255.8	#1	5
	2	Krisna A-15	400	Sep-23	-22%									400.0	392.6	385.4	378.3	#1	5
	3	Krisna C-12ST	300	Okt-23	-21%										300.0	294.8	289.6	#1	5
	4	Yvonne-B14	190	Nov-23	-8%											190.0	188.7	#1	5
Zona	Rank	Sumur	Est Qoi	Onstream Date	Decline rate	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23	Rig	est week drill
7	1	BBS-A3	31	Feb-23	-7%		31.0	30.8	30.7	30.5	30.3	30.2	30.0	29.8	29.7	29.5	29.3	#4	5
	2	ABG-C	300	Feb-23	-23%		300.0	294.3	288.8	283.3	277.9	272.7	267.5	262.4	257.5	252.6	247.8	#5	7
	3	ABG-C1	300	Feb-23	-18%		300.0	295.5	291.0	286.6	282.3	278.1	273.9	269.7	265.7	261.7	257.7	#6	7
	4	CMR-STO2	300	Feb-23	-23%		300.0	294.3	288.8	283.3	277.9	272.7	267.5	262.4	257.5	252.6	247.8	#7	7
	5	MLD-B5	218	Feb-23	-23%		218.0	213.9	209.8	205.9	202.0	198.1	194.4	190.7	187.1	183.6	180.1	#8	7
	6	CLU-INF1	282	Feb-23	-20%		282.0	277.3	272.8	268.2	263.8	259.5	255.2	250.9	246.8	242.7	238.7	#9	7
	9	HGD-INF1A	373	Apr-23	-25%				373.0	365.2	357.6	350.2	342.9	335.7	328.7	321.9	315.2	#4	7
	10	HGD-INF1B	375	Apr-23	-47%				375.0	360.7	346.9	333.7	320.9	308.7	296.9	285.6	274.7	#5	7
	11	TTM-A1	100	Apr-23	-21%				100.0	98.3	96.6	94.9	93.3	91.6	90.1	88.5	87.0	#6	7
					Regional 2	Jan-23	Feb-23	Mar-23	Apr-23	Mei-23	Jun-23	Jul-23	Agu-23	Sep-23	Okt-23	Nov-23	Des-23		
					Opt Case	979.0	3344.1	4091.8	5064.5	6581.2	7375.6	7221.4	7340.9	7592.5	7757.1	7770.1	7525.4		

The Quick Win Program simulation result show an increase in production indicated by the optimized case compared to the original case in forecast production profile of RKAP 2023 development wells (Figure 8).

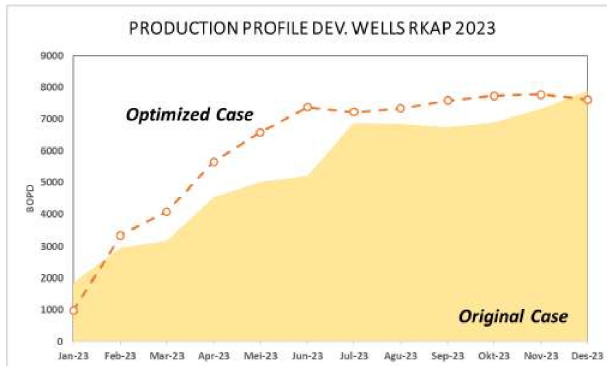

Fig. 8. Percentage of Each Alternative Ranking Category

IV. FINDINGS AND DISCUSSION

The proposed wells at Pertamina cannot be separated from the oil and gas field development portfolio itself. Proponents of proposed wells will look at data related to the subsurface aspect of the oil and gas field. The subsurface aspects that are seen are from resources, availability of POD/FID, reservoir management, subsurface-surface-environment issue, infrastructure, structural & facies, water cut, and IOR/EOR. The more complete the data criteria, the lower the uncertainty of the proposed well and the higher the confidence of the proposing team. Fields that have a medium or low category are not completely without a future. Fields with medium to low priority still have untapped potential, so that one day the ranking of a field can improve.

The Weighted Sum Model and Decision Tree Analysis were chosen based on the author's thoughts, taking into account the number of oil and gas structures/fields and the proposed development wells. Based on calculations using the Weighted Sum Model and Decision Tree Analysis, proposed fields and wells such as Zulu, LL, Krisna, BBS, and ABG rank at the top. This high ranking well is in accordance with the actual conditions in the field.

Decision making analysis in the development of oil and gas fields is proven to be able to contribute time efficiency and effectiveness of drilling from the specified target, due to more mature preparation and planning. With Decision Making Analysis, companies can selectively choose projects that benefit their business through the decision-making stages from the initiation stage, selection stage, further study stage, before finally entering the execution stage. DMA can also participate in determining decisions between organizations that are more integrated with decision making that remains objective.

V. CONCLUSION

The Quick Win Program in Regional 2 is one example of the successful use of the Decision-Making Process. A similar program can also be used as an analogy and can be applied in other Regional in the Subholding Upstream. The implementation of the Quick Win Program can still be improved by adjusting the proposed wells for certain months of production (especially January and December 2023) to increase the production forecast above the target, as input for the management team as decision makers.

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