EVALUATION OF SEARCH AND RESCUE OF POLICE AIR WING OF MALAYSIA

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Abstract. Search and Rescue involves the usage of resources in order to find missing persons and rescue them. In Aviation Search and Rescue, this means using certain aircraft to perform the search and subsequently the rescue. In Malaysia, the Royal Malaysian Police Air Wing is involved in Search and Rescue where they are equipped with trained personnel and specialized equipment and aircraft. This paper highlighted the characteristics of the Search and Rescue via a simplistic evaluation using questionnaires.
Keywords: Aviation Search and Rescue, Malaysia, Police Air Wing, aircraft

1. Introduction

Each country has their own team or organization that conduct Search and Rescue (SAR). For Aviation Search and Rescue, aircraft is usually the primary vehicle used to perform the operations. The Aviation SAR comprises of crews such as pilots, spotters, flight engineers, technicians, ground crew, maintenance personnel, scheduling officers, management personnel, and others. The human resources involved are extensive.

According to Cokorilo, most Aviation SAR are provided by helicopters that are equipped with specialized equipment and various variations of helicopters are used in accordance to the mission type [1]. The Government of Canada had ordered specialized SAR aircrafts to complement their SAR Operations. These aircrafts, the C295W, have blended winglets which improve the operational of the aircrafts [2]. Flying or landing procedures and handling skills of the crew are also part of Aviation SAR. Jacobs in his paper outlined the landing approaches, such as Helicopter Enroute Descent Areas (HEDAs) and Offshore Approach Procedures (OSAPs), used for landing on offshore vessels or platforms [3].

In Malaysia, Aviation SAR is actuated by numerous agencies such as Malaysian Maritime Enforcement Agency (MMEA), Royal Malaysian Air Force (RMAF), Royal Malaysian Navy, Royal Malaysian Police Air Wing, Fire and Rescue Department of Malaysia, and others. Maidin stated that the performance of the Fire and Rescue

Department of Malaysia depended upon the skills, competencies, and crew members which would in hand affect the SAR missions [4]. Coordination among SAR agencies in Malaysia is the key in SAR operations in Malaysia where according to the Civil Aviation Authority of Malaysia (CAAM) the overall planning of SAR is headed by CAAM if the incidents involve civil aircraft [5].

As for the Police Air Wing of the Royal Malaysian Police, Abas stated that the Air Wing had been placed at a new base in Subang Airport in order to enhance the operations of the Air Wing where the new placement would allow round the clock operations (24 hours) [6]. Bakar in his article had spelled out that the pilots and spotters of the Police Air Wing were trained in stages in order to equip them with the necessary skills in SAR [7].

2. Literature Review

Otote pointed out that Aviation SAR is clad with inefficiency where the Air France 447 disaster was made an example of a slow and bogged response of SAR [8]. Otote further mentioned that SAR should be evaluated in order to iron out "defects" in SAR. Otote had evaluated the SAR decision making process by measuring the probability of success (pos) [8].

Ai had investigated the efficiency of SAR and had proposed that SAR be integrated with an intelligent model that is capable of producing optimum scheduling of crews and resources [9]. Ai further iterated that tasks of SAR should be delivered effectively and mentioned the tragedies of Tianyu2 and Liaosuiyu66528 which were due to ineffective SAR plan [9].

Bezgodov had studied the efficiency of SAR by analyzing the drift pattern such as the wave load at seas and collectively analyzing the response of SAR agencies in relation to this drift [10]. Bezgodov had simulated several SAR strategies, such as greedy search and snake like search, in order to gauge the efficiency of SAR operations [10]. Alexander had analyzed the SAR operations of Fiji and founded that there was a delay in the response of SAR crew towards incidents [11]. Alexander further opinionated that there should be a central coordination centre that coordinate the SAR tasks and he named this centre as Naval Operational Command. Alexander also stressed upon the importance of training, certification, and qualification of SAR crew in order for SAR operations to be performed seamlessly [11].

The Malaysian Government had presented a paper during the Asia Pacific Regional Search and Rescue Task Force in the year 2015 and had touched upon the SAR of MH370 disaster where it was stated that there was a delay in the actuation of SAR due to conflicting reports from Malaysia Airlines and the media [12]. The Malaysian Government had shown appropriate coordination by disseminating information of the SAR to Oil Rig Operators, helicopters flying in the search zones, MMEA, RMAF, and others [12].

With regards to SAR in Malaysia, the Maritime Institute of Malaysia (MIMA) had stated that coordination among agencies for the actuation of SAR is seemingly difficult as each agency has crew with different skill sets and level and each agency has different approach in SAR [13]. Furthermore, MIMA mentioned that there is a need to have a

comprehensive and optimum exercise among the SAR agencies in order to gain operational SAR which is effective [13].

Alsagoff, who hails from a university in Malaysia, had delineated that SAR operation capability is usually maximized by using suitable tactics [14]. Alsagoff had proposed a methodology, that uses Global Positioning System and SAR Tactical Management System, that would produce an optimum search pattern for SAR [14].

Based upon numerous literature above, it is shown that evaluations of SAR is important in order to identify and eradicate weaknesses. Several methods were used to evaluate SAR, ranging from probability study, scheduling study, response time, and others. In this paper we had evaluated the SAR of the Police Air Wing of Malaysia through a set of questionnaires. The questionnaires are in the form of Forced Likert Scale (with 4 points on the scale). The methodology section explained further our evaluation approach.

According to Allen, the Forced Likert Scale is a scale or question that offers the respondent no choice of being neutral where the respondent has to take side, for example whether to agree or disagree [15]. Allen added that usually the Forced Likert Scale is used for communication and media studies but not restricted to them [15].

Nadler pointed out that Forced Likert Scale usually takes the form of having 4 points on a scale [16]. Example would be the choices presented on the scale which are Strongly Agree, Agree, Disagree, Strongly Disagree. Our paper uses these 4 points or choices. Nadler also stated that Likert Scale is used to measure attitudes, psychological traits, and others [16].

Xiao opinionated that Forced Likert Scale has the ability to gain responses which have integrity and the responses can be counted as reliable [17]. Xiao also described that Forced Choice Questionnaires could unearth "hidden" responses that are hard to gain by using conventional questionnaires [17].

Morillo had done research upon Forced Choice Questionnaires and he found out that Forced Choice Questionnaires offered more control in terms of controlling the biases that existed [18]. Also Forced Choice Questionnaires is more likely to reduce dishonest responses and Morillo recommended the usage of Force Choice Questionnaires (albeit in a multidimensional form) in numerous situations [18].

The above literature gave validity to our chosen method of evaluation which is evaluation of SAR using Forced Likert Scale (with 4 points on the scale). The areas of SAR that we had evaluated is mentioned in the methodology section.

3. Methodology

The methodology to evaluate the Search and Rescue of the Police Air Wing of Malaysia is shown in Figure 1.
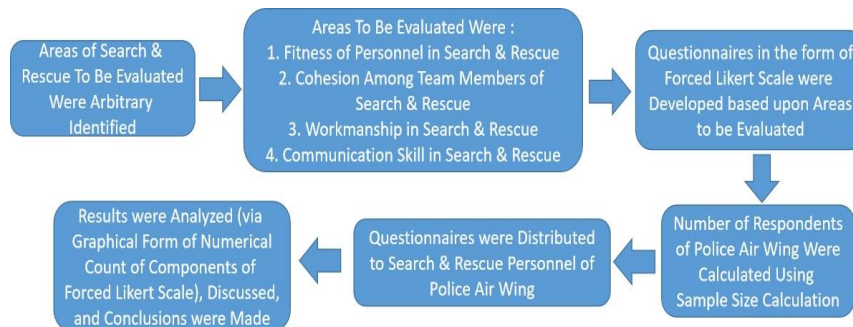
Figure 1. The Methodology of Evaluation of Search and Rescue of Malaysian Police Air Wing

The areas of SAR to be evaluated were arbitrary chosen and were also based upon heuristic. The areas that were evaluated were : Fitness of Personnel in SAR, Cohesion among Team Members of SAR, Workmanship in SAR, and Communication Skill in SAR. The Questionnaires were developed based upon the areas that were evaluated and the questionnaires were in the form of Forced Likert Scale with components such as Strongly Agree, Agree, Disagree, and Strongly Disagree.

We also had calculated the required minimum number of respondent to answer our questionnaires. The calculation was done using the Sample Size Equation where the total number of personnel (population) of the Police Air Wing which is 253 was inserted into the equation. The confidence level was set at 80% and the margin of error was set at 5%. The calculation gave us a value of 100 which indicated that the required minimum number of respondent is 100. We had managed to obtained 100 respondents of the Police Air Wing and they had answered our questionnaires.

The results that we had gained were analyzed where the numerical count of Strongly Agree, Agree, Disagree, and Strongly Disagree were noted and graphed (for the areas of SAR that were evaluated). The analyses were then discussed and concluded.

4. Results
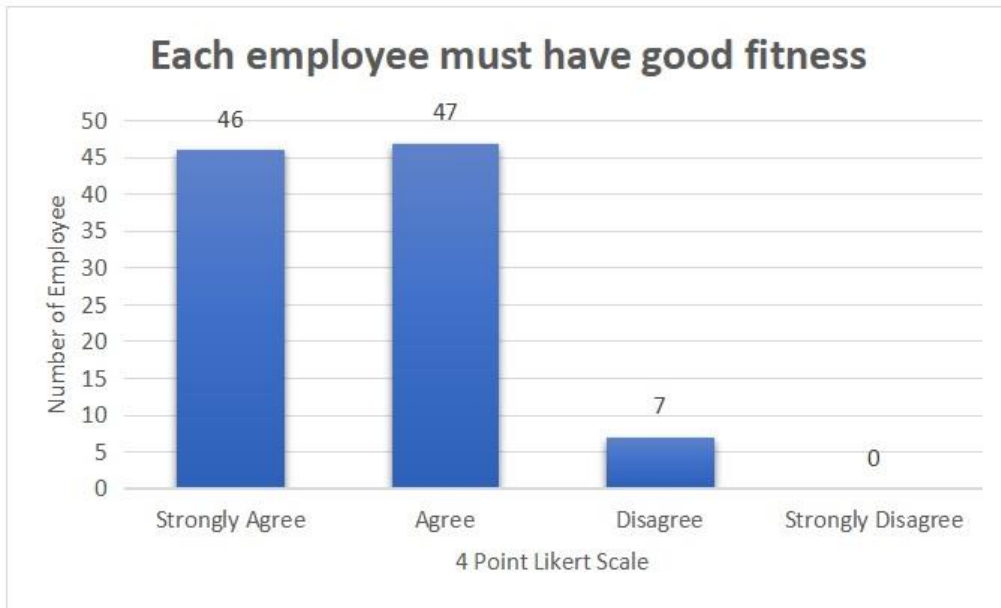Figures 2, 3, 4, and 5 show the results in graphical form.

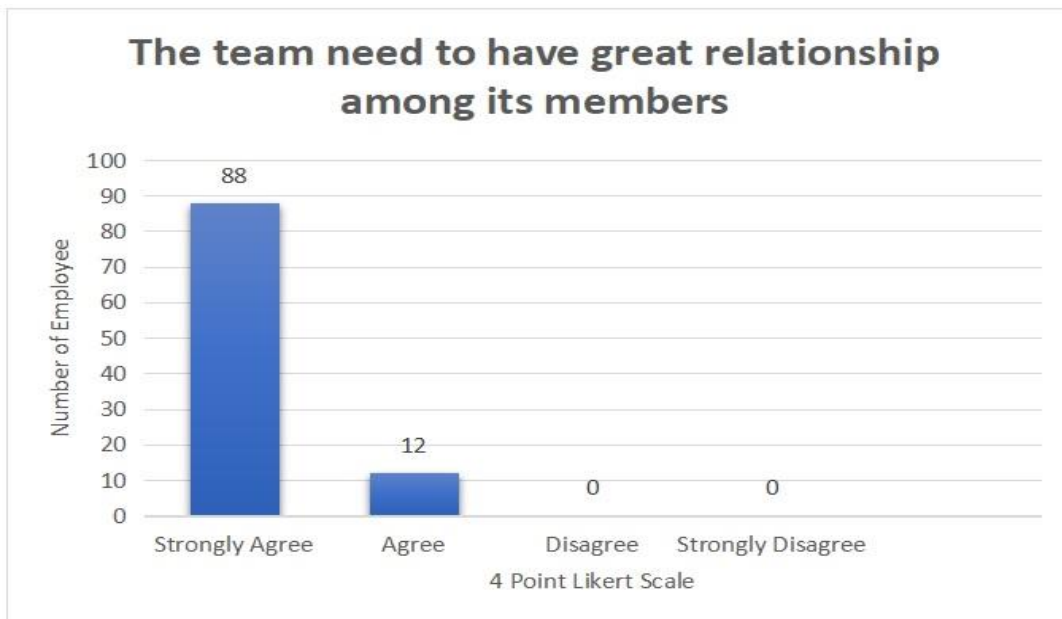**Figure 2. Likert Scale - Fitness of Personnel in Search and Rescue**

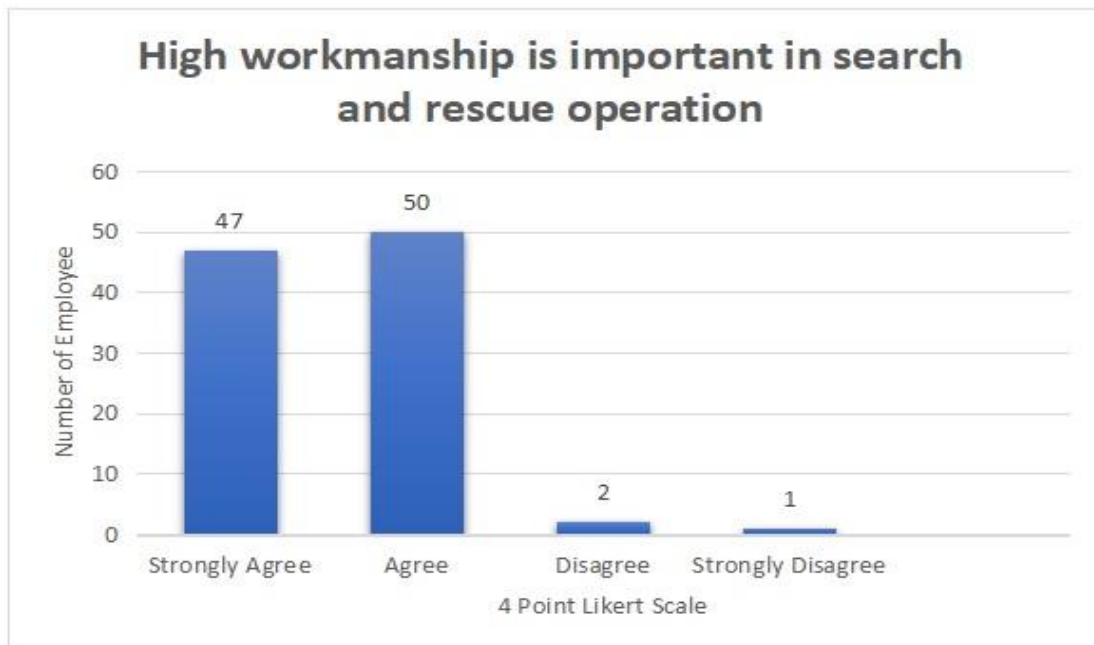**Figure 3. Likert Scale - Cohesion Among Team Members of Search and Rescue**

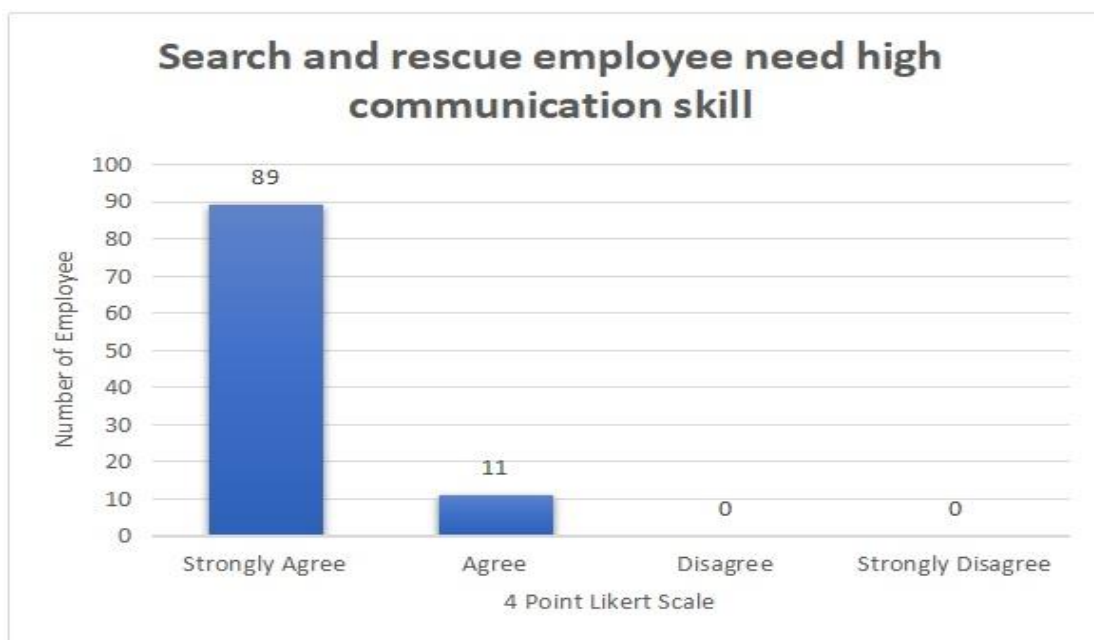**Figure 4. Likert Scale - Workmanship in Search and Rescue**

Figure 5. Likert Scale - Communication Skill in Search and Rescue

5. Discussion

Figure 2 shows the responses toward the statement "Each employee must have good fitness". 46 respondents Strongly Agree, 47 respondents Agree, 7 respondents Disagree, while 0 respondent Strongly Disagree. This shows that majority of the

members of the SAR team are in unison to uphold or retain a high degree of fitness in order to have or gain effective SAR operations. 7 respondents disagreed but that only constitute 7% of the total respondent. Thus we can safely say that the voice of the majority is valid. In SAR its imperative to have adequate fitness in order to perform physical tasks such as jumping from the helicopter to save victims in the ocean, sitting for prolonged hours in aircraft to conduct searches, hoisting and carrying victims, and others.

Figure 3 shows the responses toward the statement "The team need to have great relationship among its members". 88 respondents Strongly Agree, 12 respondents Agree, 0 respondent Disagree, while 0 respondent Strongly Disagree. There were no disagreement towards the statement in Figure 3. In fact 100% of the respondent agreed that cohesion is vital in the success of the team and subsequently in the success of the SAR operations. Also 88% of the respondents responded that they are highly in support of extreme cohesion among team members.

Figure 4 shows the responses toward the statement "High workmanship is important in search and rescue operation". 47 respondents Strongly Agree, 50 respondents Agree, 2 respondents Disagree, while 1 respondent Strongly Disagree. It seems that 3% of the respondents do not agree upon the significance of workmanship in SAR operations. We can perhaps make a slight conjecture that the introduction of automation in aircraft and equipment had sidelined or relegated workmanship. And this was conjectured via the responses of the respondents. But 97% of the respondents were in agreement of the significance of workmanship in SAR activities.

Figure 5 shows the responses toward the statement "Search and rescue employee need high communication skill". 89 respondents Strongly Agree, 11 respondents Agree, 0 respondent Disagree, while 0 respondent Strongly Disagree. All of the respondents agreed upon the importance of communication during SAR operations since the crew members need to communicate effectively to perform certain tasks. For example, hoisting a victim from the ocean requires fluid coordination and communication among pilots, divers, operators of the hoisting mechanism, and others.

6. Conclusions

Analysis of the responses showed that majority of the SAR crew of the Police Air Wing were in agreement of the importance of fitness, cohesion, workmanship, and communication in SAR operations. We can make a minor deduction that the crews are motivated to perform at their best and hence their stand in acknowledging the significance of the areas mentioned above. Although there were members that downplayed the importance of fitness and workmanship, they are in the minority (7% and 3% respectively). Also we take note of the fact that cohesion and communication scored highly in the level of importance. We can say that the "brotherhood bond", which is a norm among armed forces or uniform forces, is alive among the members of the Police Air Wing.

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