Evaluating Strategies for Controlling Attrition Rate of Canadian Air Force members

Arif Mehmood, Ph.D.
System Dynamics Consultant
Tel: + 1516 8743775
Email: amehmood73@gmail.com
Jules Vanié, Ph.D.
(D Air Pers Strat 4, Chief of Air Staff)
National Defence Headquarters, Ottawa, Canada

Abstract

The Canada's Air Force (CAF) has been faced with a challenge of retaining skilled, qualified, and trained professional members. It is common that every year approximately 10 to 15 percent of members from almost all occupations leave the CAF at various ranks. Due to such consistent loss of members, shortage of members has been causing a multi-dimensional undesirable impact (such as work overload, imbalance between work and family life, delays in training and promotions) on the existing members. The researchers at the CAF have identified factors that contribute to attrition rate of members, for example, these factors are lower pay and benefits relative to civilian jobs, undesired postings, imbalance between work and family life, low provision of advanced tools and equipment, limited resources for skills development, lack of challenging work, and more engagements in non-job related activities. This research explores the underlying structure that drives attrition rates of members. A formal dynamic simulation model is developed that replicates the attrition problem of the CAF. The development of the model uses the data collected through interviews of subject matter experts, and reports of previous work carried out by the CAF staff. The parameters of the model are calibrated based on numeric data of seven years from 2000 to 2007. The model results are quite promising and consistent in replicating the historical data. The simulation model presented here demonstrates the capability of evaluating the relative benefit of polices aiming at controlling the attrition rate. The model with the refinements of heuristic non-linear relationships based on empirical evidence will be a more robust decision-support tool that would help in understanding the resistance to achieving a sustainable reduction in the attrition rate, and designing effective and robust strategies for controlling attrition rates.

1 Background Introduction

The Canada's Air Force (CAF) supports a wide variety of domestic and international operations. These operations include surveillance and control of Canadian airspace, world-wide airlift of Canadian Forces personnel and material, support to the operations of the Navy and Army, search and rescue, and humanitarian operations. There are 13 Wings (Bases) stationed across the Canada where members of the CAF are deployed for flying search and rescue missions to save lives, intercepting Aircraft or ships carrying illegal drugs, and providing relief during national disasters like floods. At international level members of the CAF perform various roles such as flying peace support missions and conveying relief workers, supplying emergency food and medical supplies to scenes of natural disasters.

To meet the present and anticipated needs of domestic and international operations, CAF has to maintain a reasonable number of trained members (i.e. Preferred Manning Level) of various occupations at different ranks. For the last several years CAF has been faced with a challenge of retaining skilled, qualified, and trained professional members. It is common that every year approximately 10 to 15 percent of members from almost all occupations leave the CAF at various ranks. Due to such consistent loss of members every year, shortage of members relative to PML of the CAF for both Officers and Non Commission Members (NCMs) has been a major concern. Consequently, this shortage is causing a multi-dimensional undesirable impact (such as work overload, imbalance between work and family life, delays in training and promotions) on the existing members.

Considerable focus has been placed on increased recruitment of new members for augmenting the size of the CAF. However, absorption rate of members is limited for several reasons including inability to properly training and placing them in effective operational positions due to the shortage of dedicated experienced members. The other reasons for leaving the CAF include slow raise in pay compensations relative to civilian jobs, undesired postings, imbalance between work and family life, low provision of

advanced tools and equipment, better civilian opportunities, limited resources for skills development, lack of challenging work, and more engagements in non-job related activities. These reasons are identified in previous research work carried out by the researchers (for example, Parker, 1990, 1992, Bernard et. al., 2003, Norton, 2003, Urban, 2006, 2007, Morrow, 2002, Dunn, 2002) at the Canadian Forces (CF).

In addition to reasons mentioned above for leaving the CF, another reason is the aging factor. Currently, a substantial proportion of both Officers and NCMs belong to an age cohort of 40 and 50 years who will retire from the CAF in near future. It is anticipated that due to the faster attrition than production rate of members the shortage of CAF members might become more significant. It is likely possible that consistent shortage of members for a long period of time could have serious consequences for succession planning and the sustainability of the CAF.

Concerted efforts are in progress at the CF to control the attrition rates. These efforts include close monitoring of the attrition rates at various points in the career progression of members. It has been observed that consistently attrition rates are higher during initial training and after obligatory service is completed. At 20 Years of Service (YOS), members (under the old terms of service) are eligible for an immediate annuity. Therefore, larger proportions retire at 20 YOS and beyond. After 35 YOS, pension of members is maximized and attrition becomes very likely (DND, 2004 - 2005).

For the last several years CF has been conducted a number of studies (for example, MOS ID 00184 Report 2007 and MOS ID 00021 Report 2007) on attrition rates. These studies are based on information gathered through surveys from members of various occupations at different ranks. The purpose of these studies was to identify attrition antecedents at the occupation level and causal links to attrition at the environmental and organizational levels. The surveys generally focused on measuring attitudes of members on a predefined scale to explore members' perceptions of work, career and organizational and retention culture issues that could be sources of dissatisfaction and intentions to leave, as well as

demographic information. The researchers at CF have analyzed the information gathered through survey using Regression techniques to explore statistical significance of the correlation between various factors that contribute to attrition rates. It is noted that most of the findings of survey based studies carried out in early 90s and recently are unchanged that implies it is more than a decade members of the CF have been faced with some of the same issues that requires immediate attention.

The decision of members to stay or leave the CF does not necessarily depend on one or two specific issues. Numerous issues within the CF overtime create frustration among members. Consistently and continuously existence of these issues raises the frustration to an unacceptable level that encourages members to leave. It is therefore important to investigate the origin of these numerous issues, and dynamic impact of these issues on frustration level of members during their career progression. Instead of investigating each issue individually in an isolated or unrelated manner, it is required to study the interrelationships between various issues together as a whole.

This project focuses on developing an integrated dynamic simulation model. The simulation model will integrate various factors contributing to attrition rates of members at various ranks. The underlying system structure (interconnections between different elements of the system) will be investigated that will help in understanding how the factors contributing to attrition rate change overtime. In order to design an effective and robust intervention to establish a sustained environment to encourage members to stay, and feel satisfied with their careers at CF, it is imperative to fully understand the resistance to achieving desired outcomes of certain interventions.

It is likely possible that change in one factor ripples out to affect other factors, and change in other factors could ripple out in turn to affect the first factor. For example, due to high attrition rate shortage of members relative to increasing demand could rise, and increased shortage would create undesirable working conditions, consequently dissatisfaction level of members might rise, and they could decide to leave which could

further strengthen the cycle of increase in the attrition rate, assuming that other factors in the system are constant. It is not possible to assess the implications of changes in factors once they change overtime, as sometimes a change in one factor takes time to influence other factors. Time to influence could be short or long depending upon the factors and various situations. The dynamic simulation model while replicating the interconnections between different factors would also incorporate the respective time delays between factors. It is expected that end product of this research would be a fully integrated decision-support tool that will help in quantifying potential consequences of various interventions aiming at controlling the attrition rates.

2 Data Used for this project

The development of System Dynamics based model requires three types of data: 1) Historic time series numeric data, 2) Written data and 3) Experiential data.

1. Historic time-series numeric data

The purpose of collecting historic time series data is to understand the historic trends related to various variables such as intake, attrition rate, number of members at various ranks. The historic time series data is collected for seven years from 2001 to 2007. In addition to understand historic trends, this data will also be used to calibrate and validate parameters of the dynamic simulation model.

2. Written data

Written data refers to previous research reports and papers related to human resource management issues within and outside the CF. For this research a number of reports are obtained that describe previous work carried out on retention problems in the CF. The knowledge gained through review of previous work reports contributed in developing the dynamic simulation model discussed in this paper.

3. Experimental data

The experimental data refers to information stored in the heads of subject matter experts who gather information based on their experience while working with the CAF. The experimental data includes information that may not be reflected in written or numeric databases. In SD modeling experiential data is recognized as a rich source of information that must be obtained by interviewing subject matter experts. For this project ten subject matter experts are interviewed including Career Managers who manage personnel management issues in CAF.

3 Factors contributing to Attrition rates

Based on review of data collected in this project, it is found that attrition rate not only depends on one or two specific factors but it is a complex web of factors that makes members to reconsider their careers. Figure 1 depicts these multi-faceted factors that influence attrition rates, these factors are most common for many occupations of the CF.

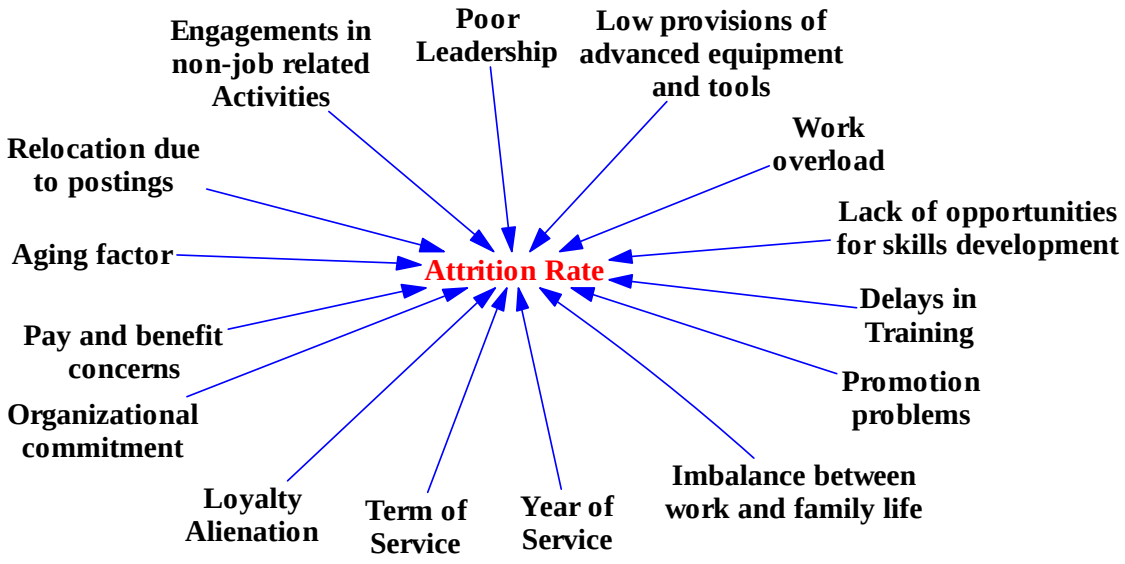

Figure 1 Factors contributing to attrition rates

It is required to understand the root causes of these factors, overtime how these factors change to influence attrition rate. A change in one factor could cause change in other factors, as these factors are interdependent to each other. Though, change in certain factors might take time to appear depending on factors and situations. For example, if members leave the CAF due to “delayed training” or “less pay compensation” then available number of members would decline, and due to this decline it is likely possible that work overload might rise, consequently, after a while more members might leave because of increased dissatisfaction due to work overload. Such type of dynamic processes are investigated in this project to recognize possible interconnections between different factors, these dynamic processes are discussed in the following section.

4 Dynamic Hypothesis of the model

The dynamic hypothesis refers to graphically mapping causal interrelationships between different elements, and completing the feedback loops to replicate the underlying structure of the system. The dynamic hypothesis helps to identify how different elements are interconnected to each other. Formulation of the dynamic hypothesis is based on empirical evidence obtained through data collected for this project.

Dynamic hypothesis contains of feedback loops. These loops are comprised of a series of causal linkages between variables. Instead of depicting all the feedback loops together, each feedback loop is presented individually and later on all the loops are integrated together to form a complete dynamic hypothesis of the model.

1. Effect of Work Overload

Figure 2 demonstrates potential effect of work overload on attrition rate of the CAF members. It is assumed that one of the reasons for work overload could be the shortage of available members relative to the Preferred Manning Level (PML). Shortage of members could result into work overload (i.e. working for more than normal hours or engaged in

multiple jobs) that generally makes difficult for members to sustain a balance between work and family life. Imbalance between work and family life might gradually increase frustration or dissatisfaction level of members. Consequently, it is likely possible that members might decide to change their career and leave the CAF that could reduce the available number of members (i.e. increase in shortage). If everything else in the system is unchanged then overtime this feedback loop of work overload could be reinforced itself, and it might become hard to diminish the shortage of the members.

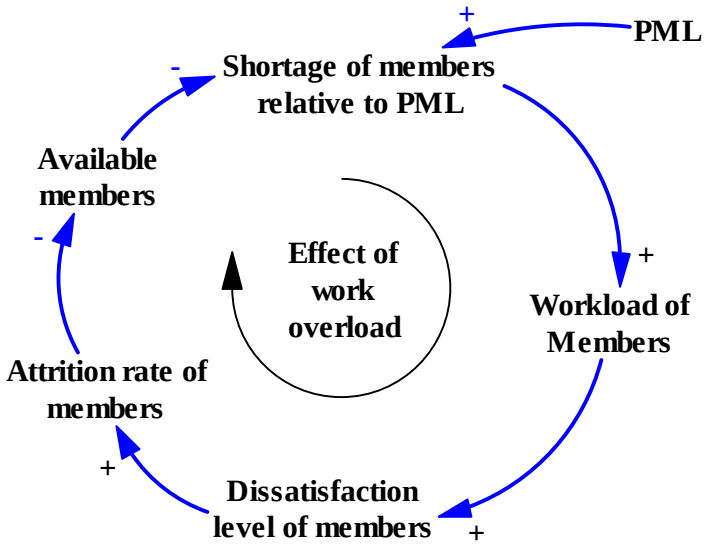

Figure 2 Dynamic hypothesis related to work overload

2. Effect of Undesired Postings

The effect of "undesired" postings on attrition rate is illustrated in the Figure 3. Some postings particularly that require relocations (approximately 2 out of 3 postings) are considered as undesired and problematic. Because relocation could create family instability, as social life of spouse and kids could be affected due to relocation. For example, spouse might lose her job due to relocation, and kids may not find the best schools or health facilities in the new locations.

Generally, most of postings are required at the time of promotion. As shown in figure 3, it is assumed that shortage of senior members creates promotion opportunities for junior members. Promotion opportunities could create promotions that require relocation (i.e. undesired postings). The undesired postings would raise the dissatisfaction level of junior members that could lead to attrition, and attrition would reduce the number of junior members. Reduced number of junior members could increase the shortage of senior members, as less junior members would be able to promote to the senior ranks. This feedback loop reflects members could leave the CAF because of undesired postings.

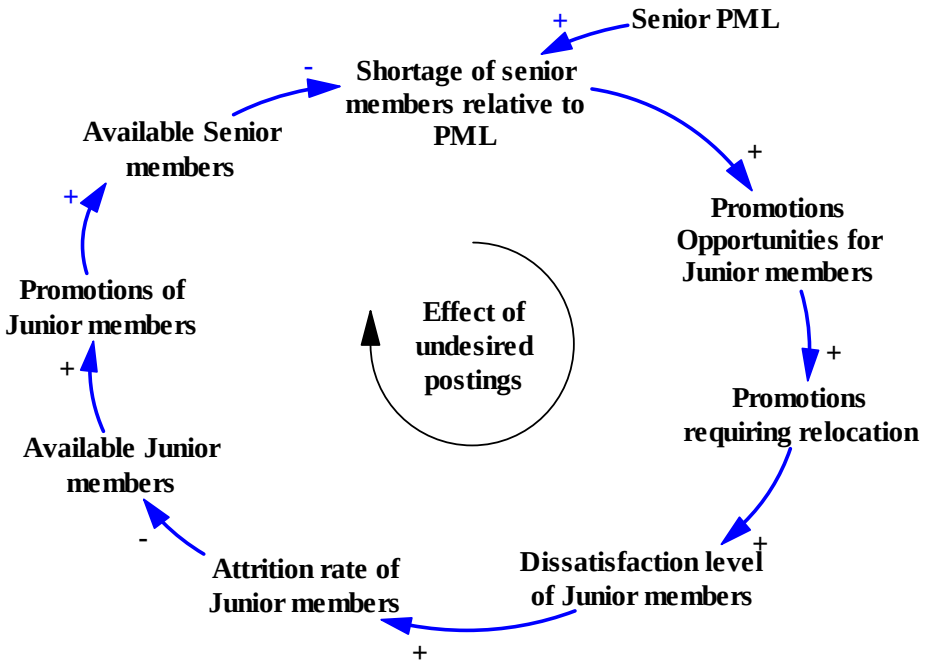

Figure 3 Dynamic hypothesis related to undesired postings

3. Effect of Delay in Training and Work Overload

During the data collection it is found that training issues such as insufficient and outdated equipment, and long training time frustrate members that could lead to attrition. One of the reasons for training issues could be the lack of resources including experienced members and up to date equipment. The effect of training issues and work overload on attrition is presented in the Figure 4.

As shown in this figure, shortage of senior members could reduce the availability of experienced and dedicated instructors to train junior members because senior members might be busy in regular activities other than supervising training. That could result into delays in training of junior members, and consequently increase in dissatisfaction level of junior members that may lead to attrition. Due to attrition of junior members the number of available junior members would reduce and over time shortage of senior members to run training courses might increase.

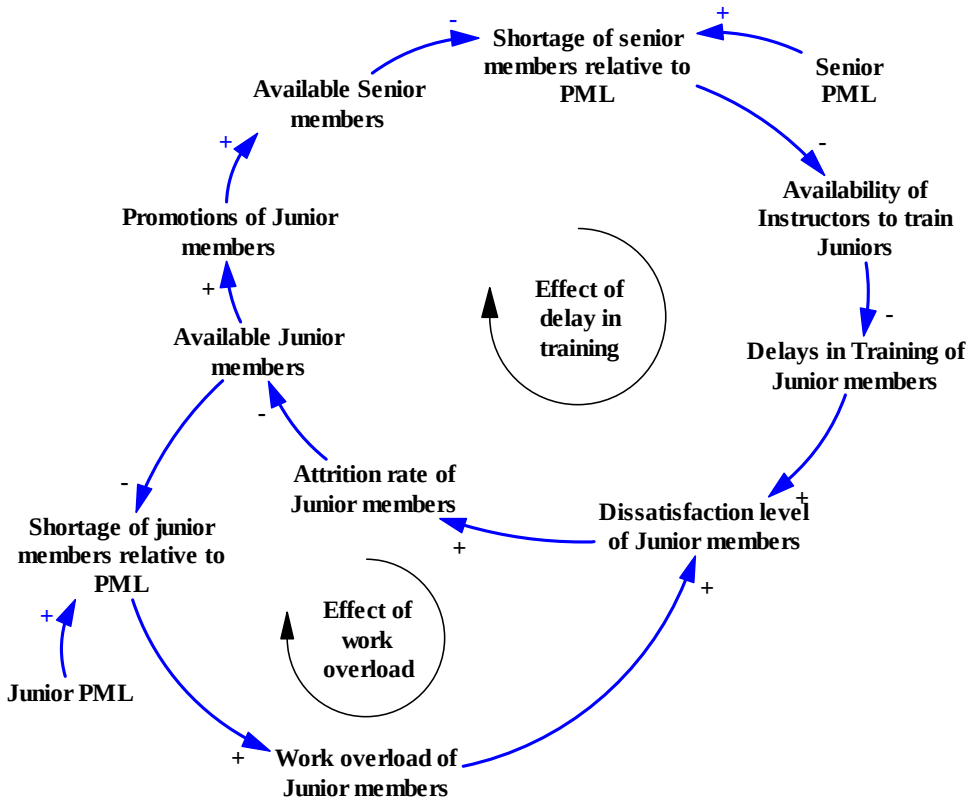

Figure 4 Dynamic hypothesis related to delays in training and work overload

4. Effect of Availability of Equipment and Tools for Skills Development

In addition to the shortage of experience dedicated members shortage of equipment and tools could limit the skills development of members. During the data collection it is found that CAF has limited up-to-date equipment and tools. For example in case of

Aircraft, CAF has a fleet of about 333 Aircrafts to perform various activities such as patrolling Canada's 15,540,000 square kilometers area, provide search and rescue operations, and manage supply to troops at various locations. In addition, CAF also supports Army and Navy in their various operations that require Aircrafts.

As demonstrated in Figure 5, availability of equipment and experienced senior members (i.e. Instructors) could facilitate the skills development activities that would provide opportunities to junior members to participate in such activities and upgrade their skills. Participation of junior members in skills development activities could be constrained by their work overload (i.e. more engagements in regular work could limit the opportunities for members to participate in the skills development activities). If the skills level of members increases then they would feel satisfied with their job (i.e. dissatisfaction level would reduce) and that could help in controlling the cycle of attrition rate.

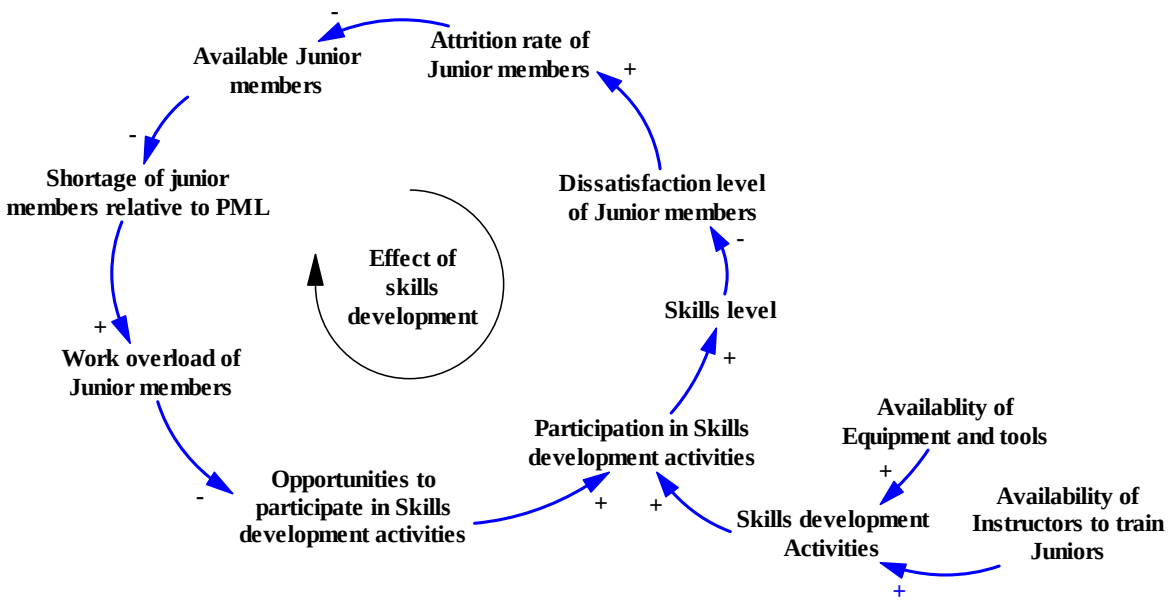

Figure 5 Dynamic hypothesis related to equipment for skills development

5. Effect of Engagements in Non-job Related Activities

Another factor that influences dissatisfaction level of members is engagements in non-job related activities. It is noted that due to shortage of members, sometimes members have to engage in activities that are not related to their profession. Continuous involvements in unrelated professional activities could frustrate members that could result into increase in their dissatisfaction level, and consequently may lead to attrition. This theory is illustrated in the Figure 6 below.

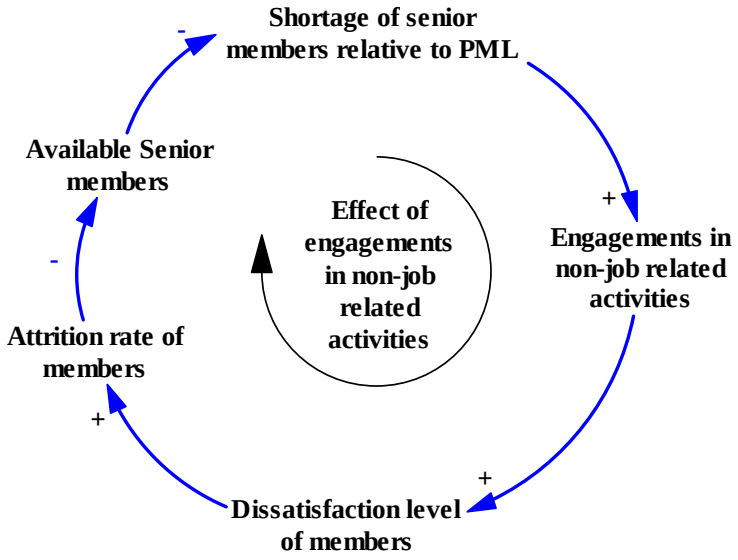

Figure 6 Dynamic hypothesis related to engagements in Non-job Related Activities

6. Effect of Pay and Benefits

It is noted that pay and benefits of the CAF members relative to the civilian jobs are not very attractive. In addition to work overload, undesired postings, and less opportunities for skills development, members feel that their pay and benefits need proper consideration to control attrition. Members particularly skilled and experienced could find better civilian jobs. For example, trained pilots have good demand in the private sector. The airline industry is growing that will increase the demand of commercial pilots. The demand of commercial pilots will be aggravated by retirements of "boomer"

generation. Similarly, other occupations of the CAF like Fire Fighters are in good demand in private sector where members might not have undesired postings or work overload situations. This implies relative attractiveness of careers in the CAF depends on multiple factors including workload, undesired postings, skills development and pay compensations.

The other factors depicted in figure 1, for example, poor leadership, commitments, and organizational support are not explicitly addressed in this report that could be added later. These various factors interact to each other over time to influence dissatisfaction level of members that lead to decision of leave or stay. The following figure 7 presents the complete dynamic hypothesis of the model that simply integrates individual feedback loops discussed above.

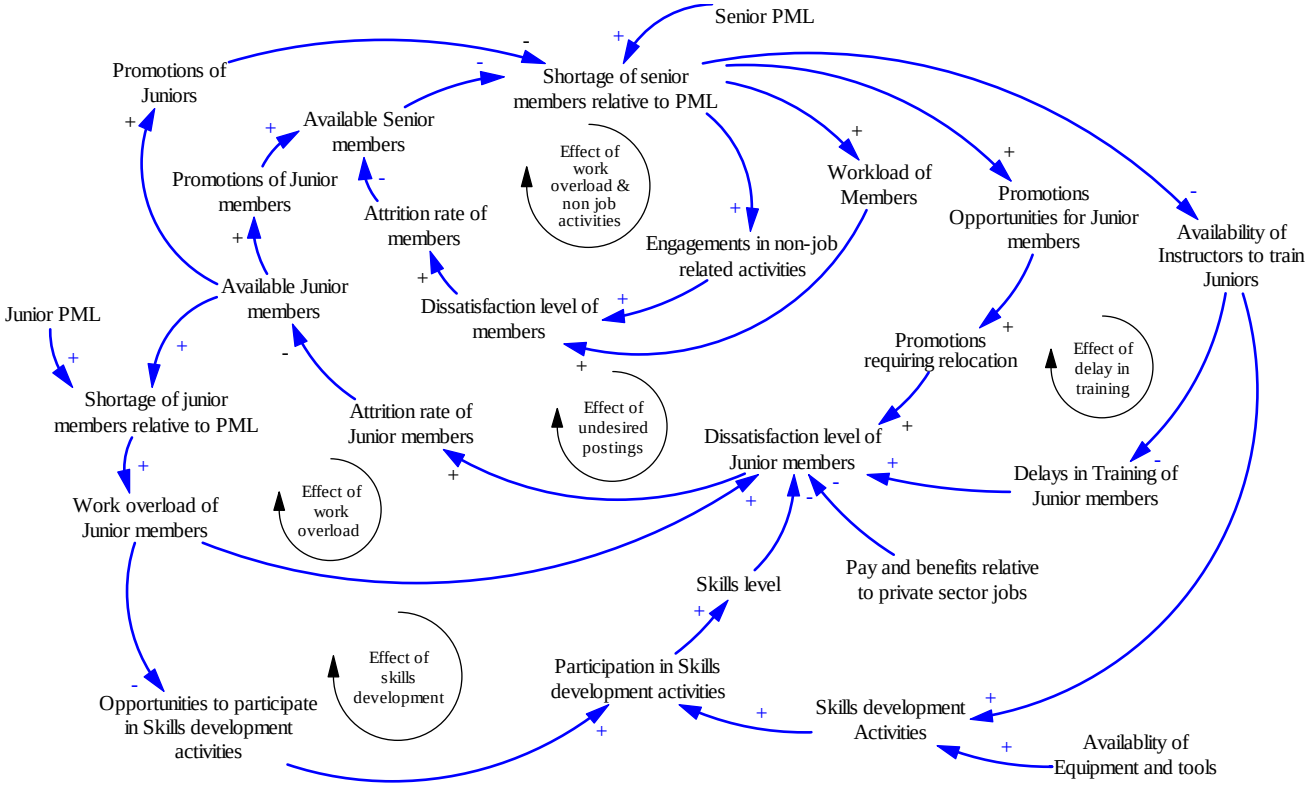

Figure 7 Complete Dynamic hypothesis of the model

5 Dynamic Simulation Model

In order to test the dynamic hypothesis described above a formal dynamic simulation model is developed using Vensim DSS program. Development of a simulation model is an iterative process that normally requires a number of iterations to obtain a model that produces outcomes close to reality in terms of producing the historic data for the "right reasons" and also in terms of developing consistency between the model structure and the real life structure.

Figures 8 to 12 present "Stock-Flow" sketches of the simulation model for Officers. A similar underlying structure (i.e. series of interconnected causal relationships) is considered for NCMs. To avoid duplication structure of NCMs is not shown in this paper. The parameter values used in the simulation model for Officers and NCMs are different; these values are calibrated based on respective historic data of seven years from 2000 to 2007.

Figure 8 shows the flow of Officers members from intake to their career progression. The stock variables (e.g. OCDT, C Lt, and Maj etc.) in figure 8 refer to ranks of Officers. The stock variable "C Lt" includes Lt, 2Lt, and Capts, these three junior ranks are aggregated together into C Lt rank. The Officers start their career at OCDT rank and progress in their career as they complete required qualifications and service duration. The time to complete required qualifications and service duration is represented as "promotion factor" in the model. The promotion factors for each rank are calibrated based on historic data of seven years from 2000 to 2007. In order to make the sketches clear in Figures 8 to 12, some of the variables and linkages are purposely hided.

It is assumed that a certain number of members leave the CAF during their career progression. The proportion of members who leave is represented by "attrition factor" in the model. As described earlier attrition depends on multiple factors, given the scope and project duration (six weeks) it is decided to focus on four factors to estimate attrition rate.

These four factors are: 1) Work overload, 2) Undesired postings, 3) Resources for skills development, and 4) Pay compensation. The effect of these factors on attrition rate is estimated separately that is discussed later in this report.

The variable in figure 8, "Additional requirement of the members" refers to the number of members required at a certain rank in addition to the existing members. It is assumed that additional requirement of members depends on demand of members, currently available members, number of members promoted to next rank, and number of members who left the CAF. For example, additional requirement of members at the C Lt rank is estimated based on 1) demand of C Lt, 2) existing C Lt members, 3) members promoted from C Lt to Maj rank, and 4) C Lt members who left.

The demand for all rank of Officers refers to Preferred Manning Level (PML) that is externally determined by the CAF staff, and provided as input to the simulation model.

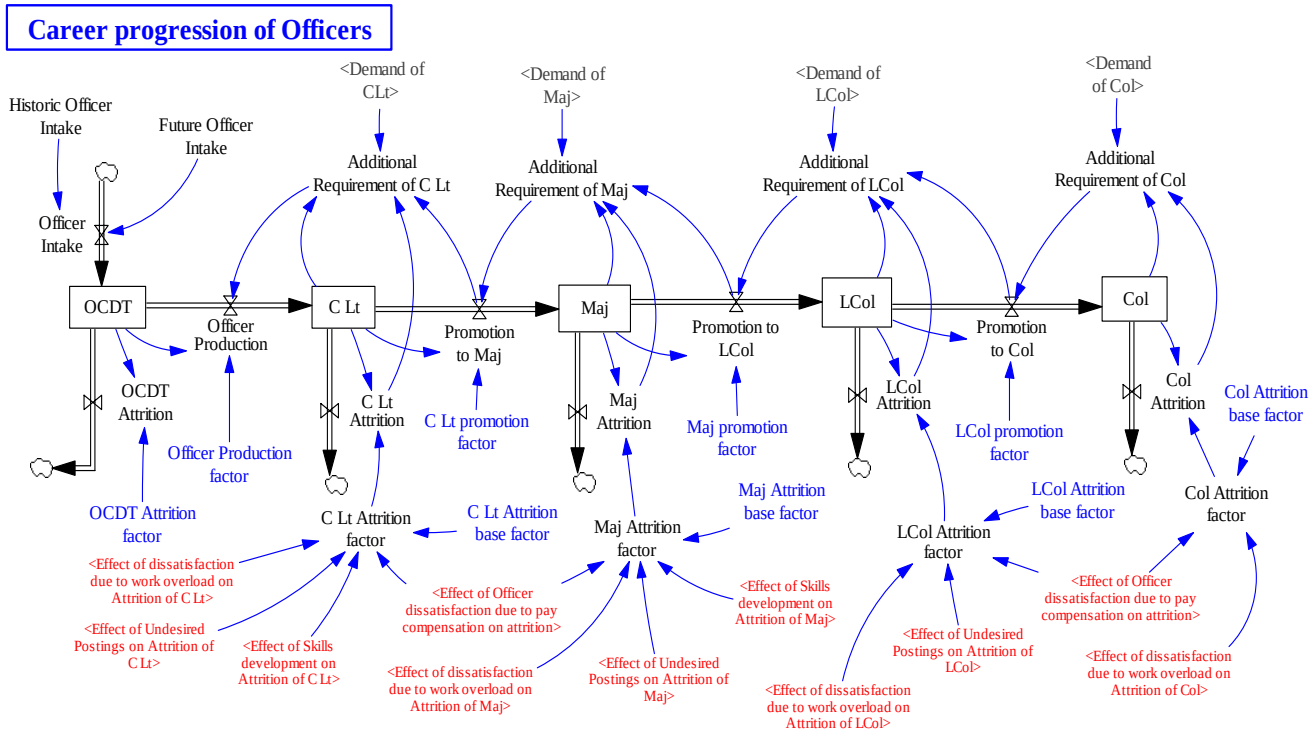

Figure 8 Career progression of Officers

The model structure related to estimating effect of undesired postings on attrition rate is shown in the Figure 9. For simplification reasons in the simulation model it is assumed that postings are required when members promote. The number of members at any rank who should be promoted is estimated by the variable "Additional requirement of members" in the model. During the interviews of subject matter experts, it is found that approximately 2/3 of postings require relocation. Such postings are considered as "Averaged undesired postings" in the model. As shown in figure 9, the effect of undesired postings is considered as a function of two variables, "Additional requirement of members" and "Averaged undesired postings. The mathematical function that estimates effect of undesired postings is a lookup table function of the relative number of undesired postings with reference to additional requirement of members. It is assumed that as the number of undesired postings relative to additional requirement of members increases the effect of undesired postings increases exponentially. The sensitivity of the shape of the lookup function is tested through sensitivity analysis of the model results.

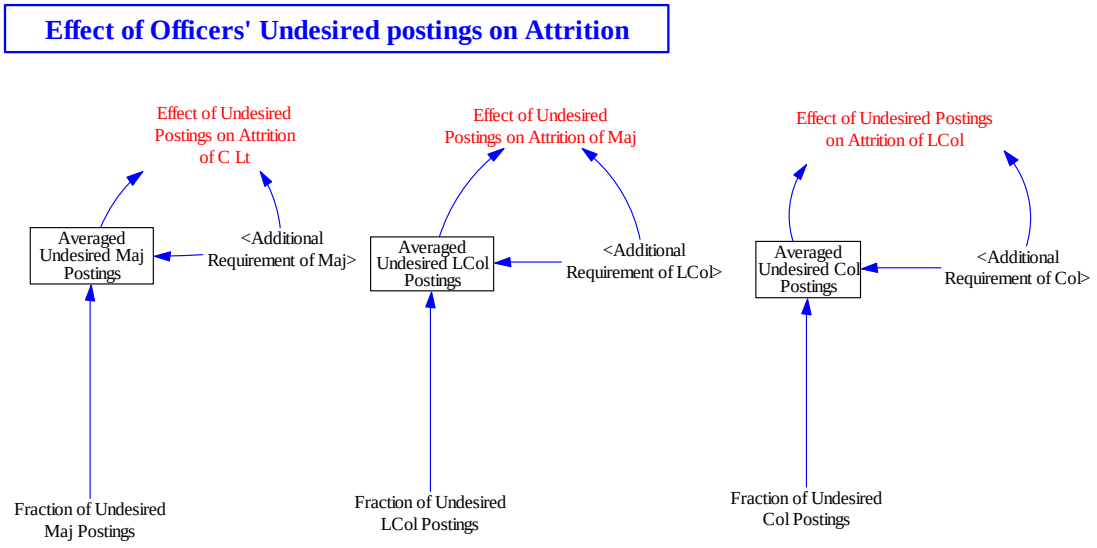

Figure 9 Effect of Officer's undesired postings on Attrition rate

The process considered to estimate the effect of work overload on attrition rate is presented in the Figure 10. As shown in this figure, it is assumed that the effect of work

overload on attrition rate depends on dissatisfaction level of members that gradually accumulates over time due to imbalance between demand and available members. The imbalance between demand and available members is reflected by the variable, ratio of demand to available members. As this ratio increases, dissatisfaction level of members also increases because they will work for long hours or engaged in multiple jobs. During the interviews of the subject matter experts, it is also noted that in addition to the imbalance between demand and available members, the factors such as mismanagement of work and increase in the new equipments also increases the work overload. The influence of these factors is represented by a constant “work overload factor” in the model. Increase in the work overload results into imbalance between work and family life. Consequently, dissatisfaction level of members rises gradually that increases attrition rate. The effect of dissatisfaction level due to work overload is also considered as lookup function that assumes as dissatisfaction level of members increases, so does the attrition rate.

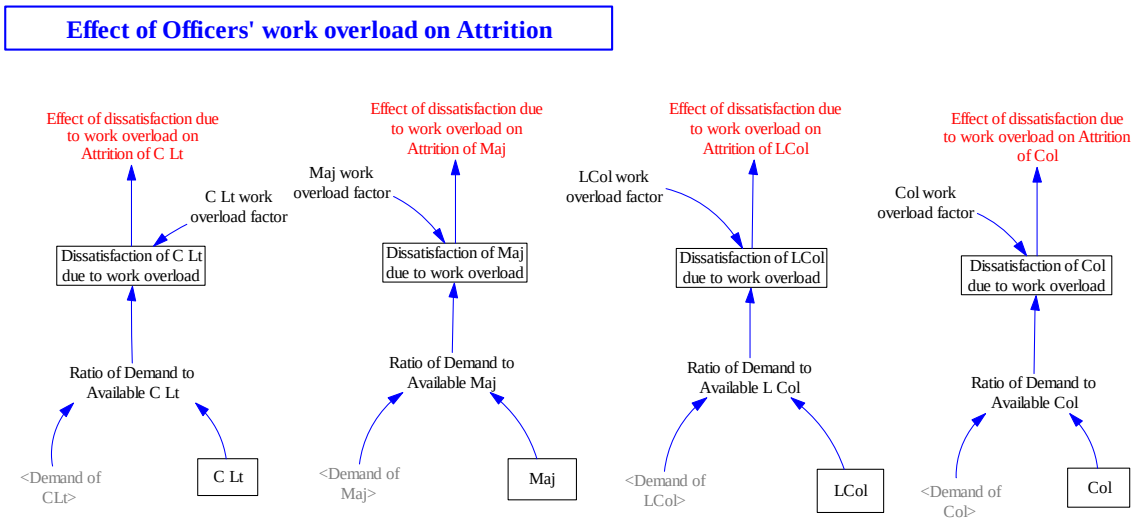

Figure 10 Effect of Officer’s work overload on Attrition rate

Figure 11 shows the process considered to replicate the effect of training resources on attrition rate. The training resources such as up-to-date equipment and instructors influence the training duration, quality of training that consequently affects the skills

development of the members. In the model it is assumed that skills development depends on participation of members in the skills development activities that are constrained by the availability of members, availability of instructors, and also availability of equipments. It is further assumed that increased participation of members in skills development activities would increase their skills, and consequently attrition rate will reduce. The reduction in attrition rate in response to skills development is represented by a lookup function that assumes as skills of members increases, attrition rate decreases.

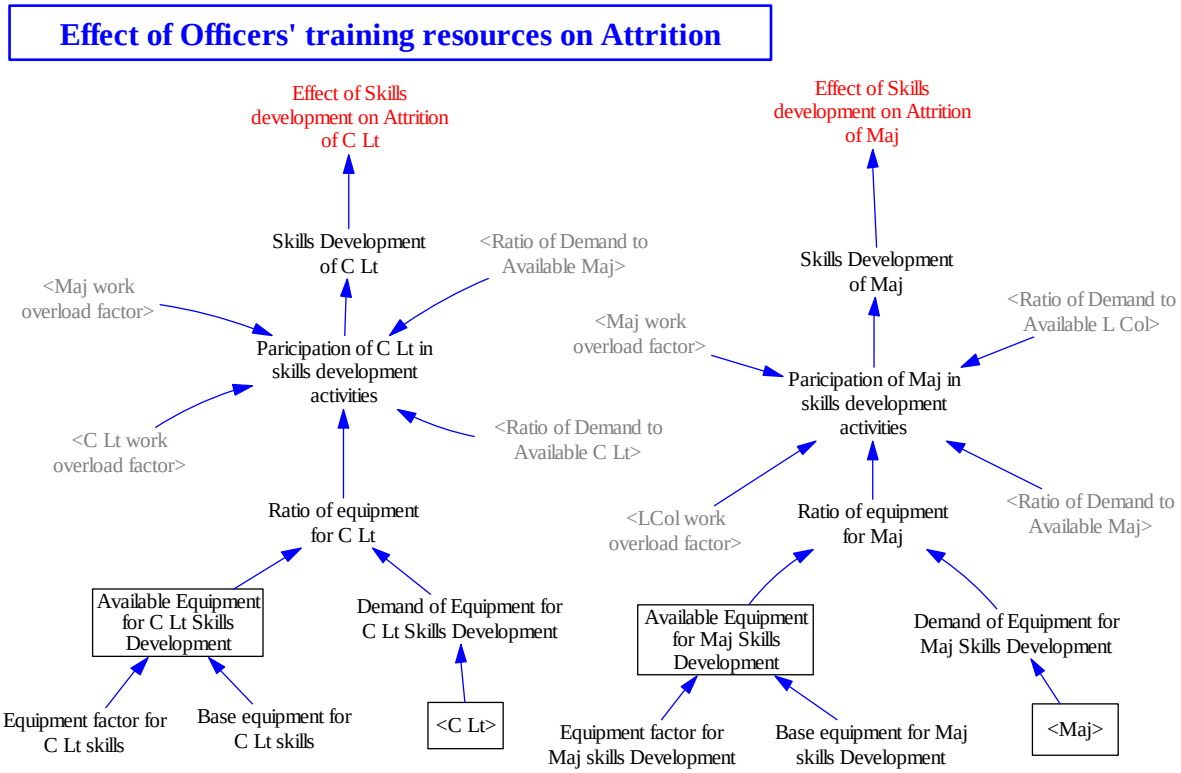

Figure 11 Effect of Officer's training resources on Attrition rate

Figure 12 presents the replication of pay compensation effect on attrition rate. It is assumed that relatively pay compensation of members in the CAF is lower than private sector pays where members could have better salaries and more benefits. The pay compensation difference gradually increases dissatisfaction level that increases attrition rate. The effect of dissatisfaction due to pay compensation is also considered as a lookup function that assumes as dissatisfaction increases, the effect also increases exponentially.

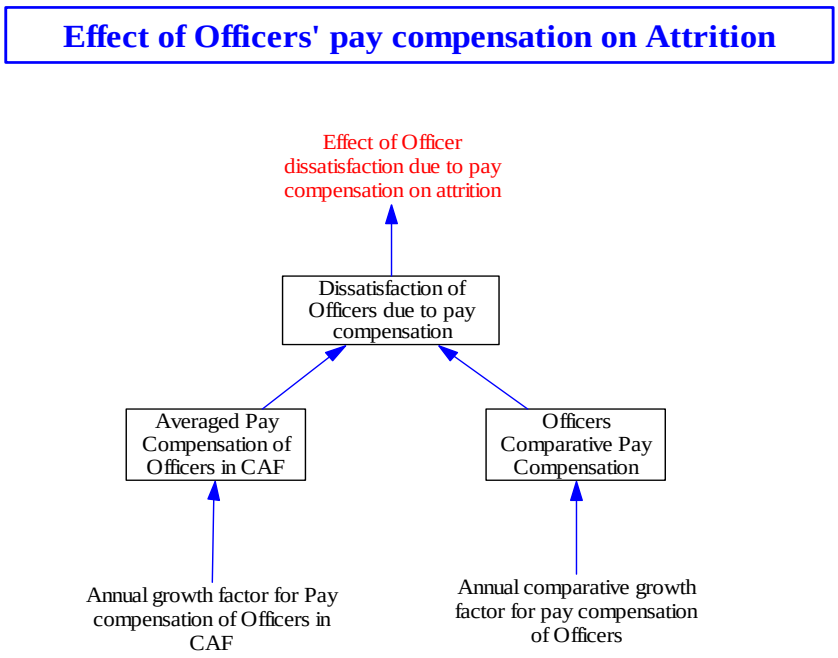

Figure 12 Effect of Officer's pay compensation on Attrition rate

6 Model Verification and Testing

Model verification and testing focused on carefully examining each component of the simulation model, and establishing consistency between the model outcomes and the historic data from 2000 to 2007. Examining each component of the model includes probing mathematical relationships between different variables of the model, verifying the model inputs from input data, and verifying the unit consistency of the model. For establishing consistency between the model outcomes and the historic data, calibration of the model parameters is carried out based on data from 2000 to 2007. The advanced features of the Vensim DSS program are applied to make the calibration process efficient. The calibration procedure is repeated several times by adjusting the model relationships and parameters in response to discrepancy between model results and historic data.

Some additional model verification tests are also carried out. These tests include "Extreme Conditions Tests and "Behavior Anomaly Test". These tests are very useful for

model verification before applying the model to evaluate the policy scenarios. In the "Extreme Condition Test" results of the model are analyzed under the extreme values of its inputs (i.e. minimum and maximum values of input). This test helped to understand how model will respond when subject to extreme conditions of its inputs. The "Behavior Anomaly Test" is another test that is carried out to analyze the model outcomes in response to changes in the some of the model assumptions.

The estimated values of the stock variables are compared with the historic data for years 2000 to 2007. Figure 20 to 29 presents the comparison between model estimates and historic for selected ranks of Pilot and Fire Fighter occupations. The results presented in these figures show model estimates are quite promising and consistent with the historical data.

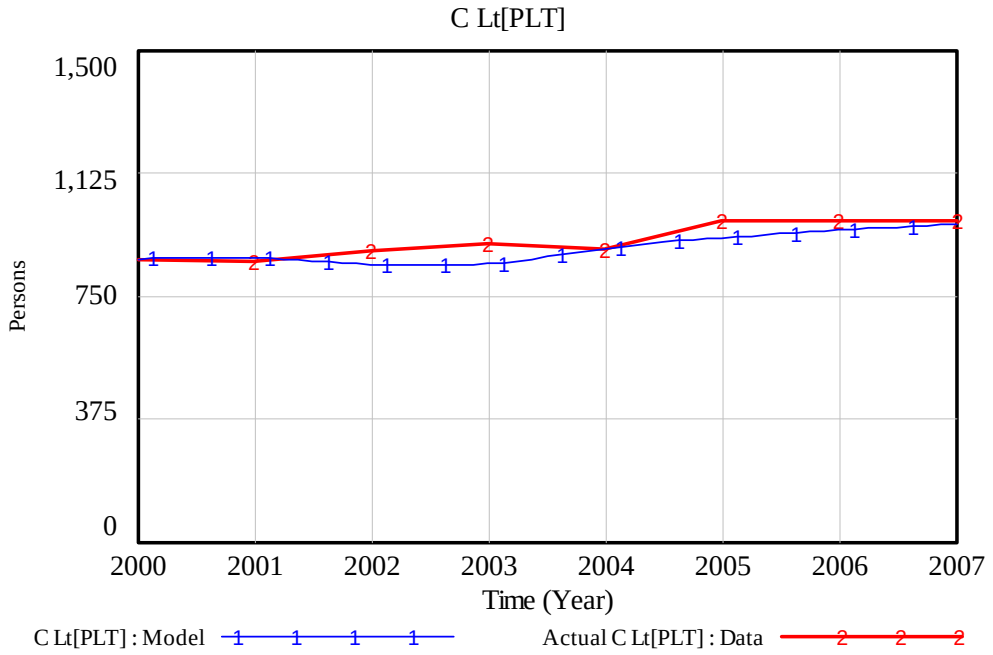

Figure 20 Comparison between model estimate and data for C Lt pilots

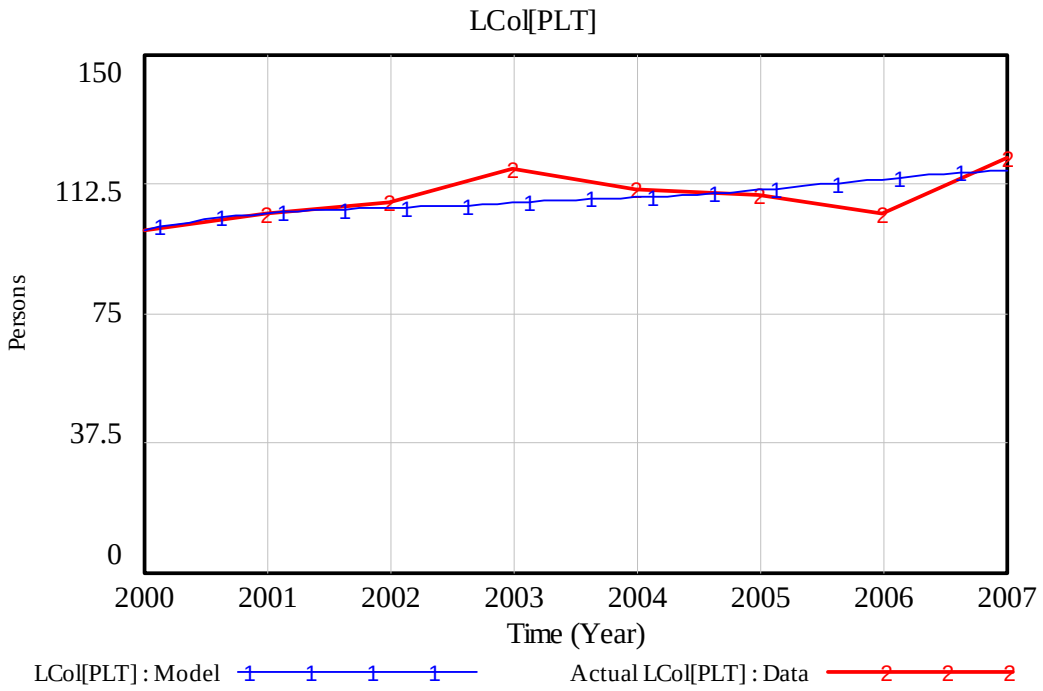

Figure 21 Comparison between model estimate and data for LCol pilots

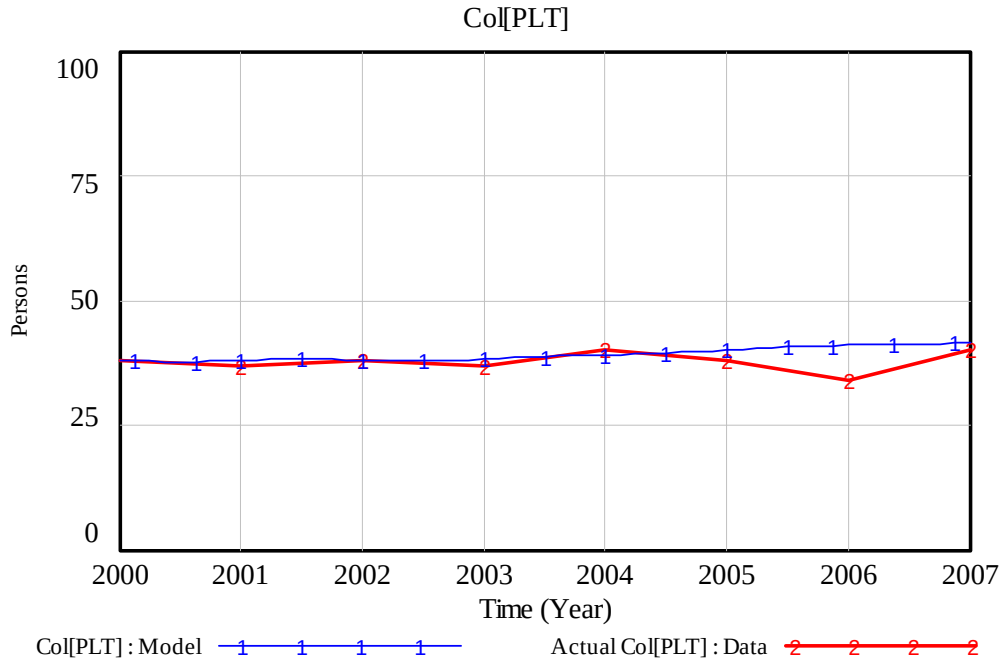

Figure 22 Comparison between model estimate and data for Col pilots

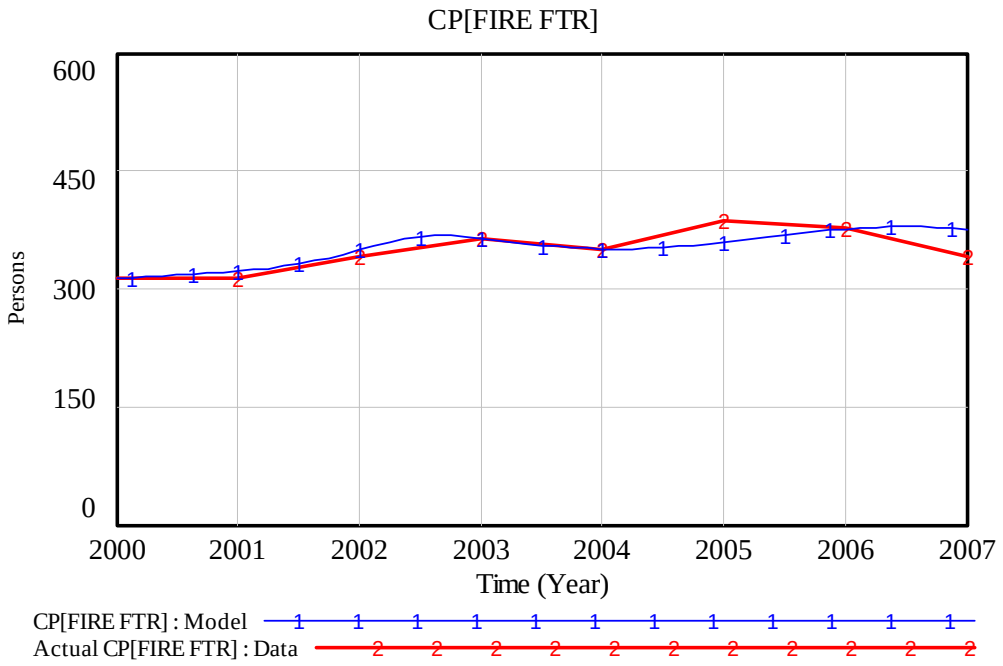

Figure 23 Comparison between model estimate and data for CP Fire Fighters

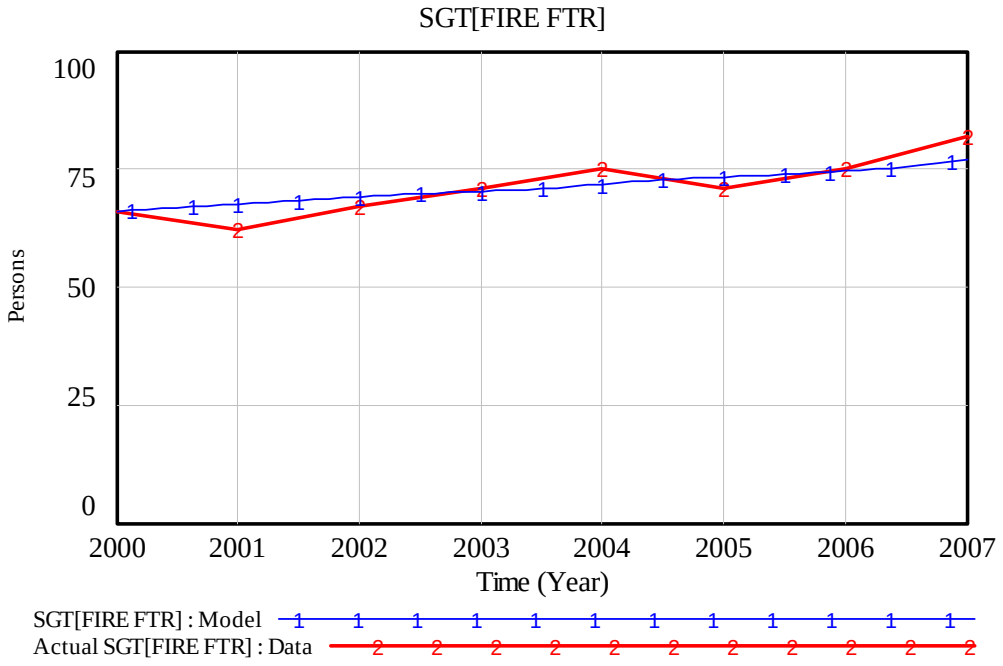

Figure 24 Comparison between model estimate and data for SGT Fire Fighters

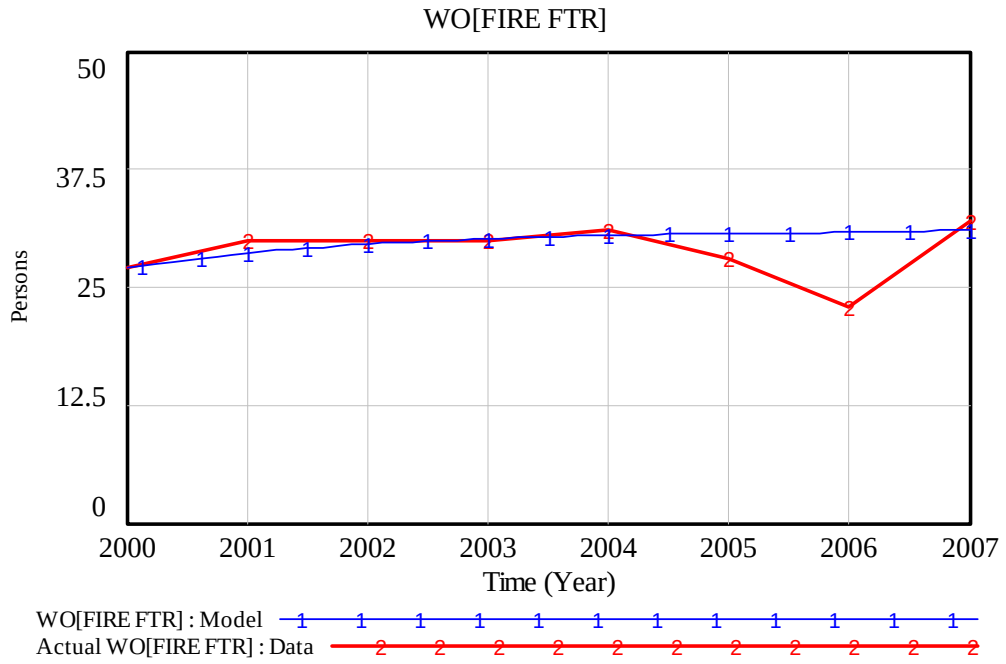

Figure 25 Comparison between model estimate and data for WO Fire Fighters

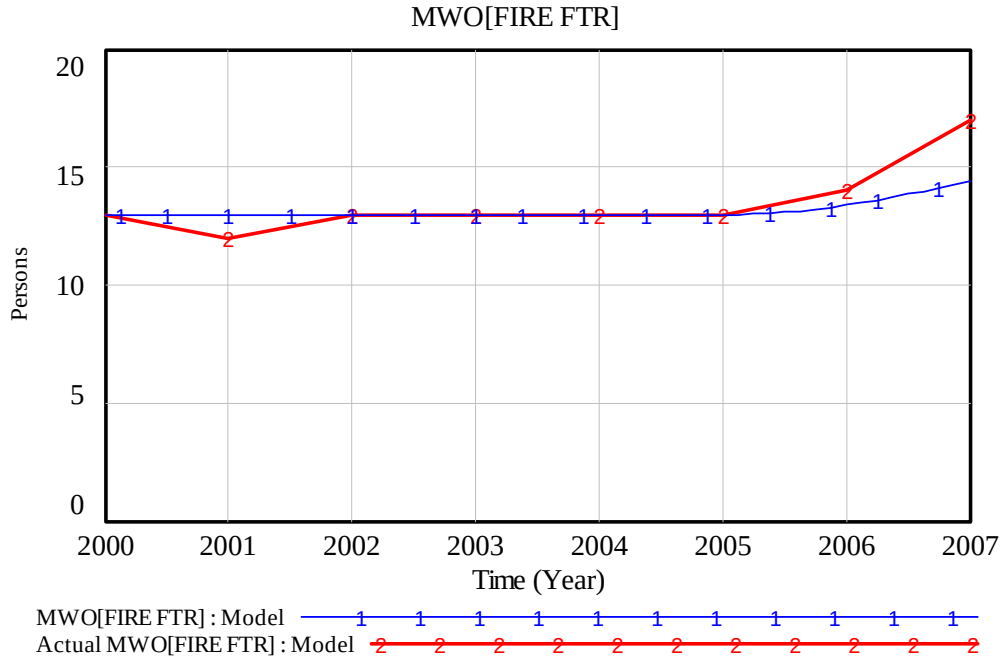

Figure 26 Comparison between model estimate and data for MWO Fire Fighters

The Root Mean Squared (RMS) error associated with the model estimates in relation to historical data is estimated by using the following formula. As expected, averaged estimated RMS error between model estimates and data is below 5 %.

$$\text{RMS Error (Trade)}^{\text{Rank}} = \sqrt{1/n \sum_{t=2000}^{2007} (\text{Trade}^{\text{Rank}}(t)_{\text{Model}} - \text{Trade}^{\text{Rank}}(t)_{\text{Data}})^2}$$

Where,

$\text{RMS Error (Trade)}^{\text{Rank}}$	=	Root Mean Squared Error between model estimates and data for different trades
Trade	=	Pilot from Officers and Fire fighters from NCMs
Rank	=	Rank of Officers and NCMs

7 Policy Scenarios

This section describes analysis of the policy scenarios carried out with the simulation model. These policy scenarios are as follows:

- Assessing impact of reduction in number of postings that require relocation on attrition rate.
- Assessing impact of increase in equipment and tools on attrition rate.
- Evaluating impact of raise in pay compensation on attrition rate.

Figure 27 presents outcomes of different policy scenarios for a variable “Total attrition of Officers” for pilot occupation. The total attrition refers to summation of attrition of all ranks that is considered as a performance indicator in this project. The X-axis in figure 27 represents simulation duration from 2000 to 2030. The Y-axis in this figure refers to total number of members who leave the CAF including all ranks.

All of the policy scenarios are implemented one by one at simulation time 2009. The results of policy scenarios are compared with the "Base" scenario. The base scenario (graph 1 in figure 27) refers to status quo situation extended in future. The graph 2, 3, and 4 represent outcomes of policies, "Reduction in undesired postings", "Raise in pay compensation", and "Increase in equipment" respectively.

The difference between graph 1 (Base scenario) and graph 2 to 4 (Policy scenarios) in figure 27 reflects potential benefit of each respective policy for reducing total attrition rate. For example the difference between graph 1 and graph 2 reflects potential benefit of "Reduction in undesired posting" policy, and difference between graph 1 and 3 reflects benefit of "Raise in pay compensation" policy. The bigger the difference of a policy scenario from the base scenario means higher benefit of that policy. The simulation results indicate policies implemented individually provide a temporary reduction in the total attrition rate and in the long run reduction in attrition rate does not sustain long but again starts increasing.

The author acknowledges that the model presented in this report needs more intense calibration and validation based on available empirical evidence. For example, the lookup functions used in the existing model are based on heuristic understanding that may require more investigation to incorporate empirical evidence.

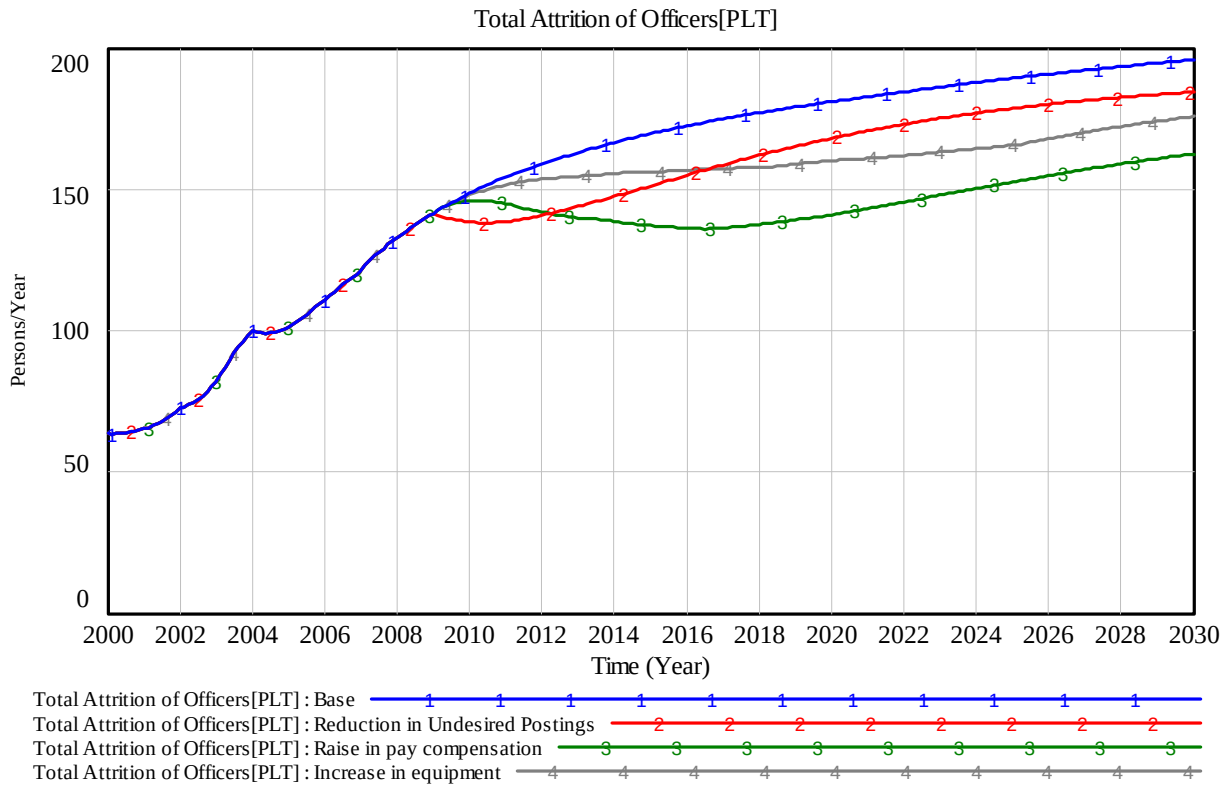

Figure 27 Outcomes of policy scenarios in comparison to base scenario

8 Conclusions

This project presents the underlying structure related to attrition rate of the CAF members. The underlying structure helps to understand the causal links of attrition factors to their possible roots, and also provides possible explanation to illustrate how factors contributing to attrition rate change overtime.

A dynamic simulation model is also developed that replicates the attrition problem of the CAF. The development of the model uses the data collected through interviews of subject matter experts, and reports of previous work carried out by CAF staff on attrition rate. The parameters of model are calibrated based on numeric data of seven years from 2000 to 2007. The model results are quite promising and consistent in replicating the historical data.

The model tracks the flow of members from intake to their career progression, and also demonstrates how gradually dissatisfaction level of members increases in response to several factors that result into attrition rate. The simulation model presented here demonstrates the capability of evaluating the relative benefit of polices aiming at controlling the attrition rate. The model with the refinements of heuristic non-linear relationships based on empirical evidence will be a more robust decision-support tool that would help in understanding the resistance to achieving a sustainable reduction in the attrition rate.

9 Acknowledgements

The author wishes to thank all the officials of the CAF who participated in this project, contributing their time, knowledge and advice. Many thanks to Maj. Andrew D Sedlar, Dr. Jules Vanié, Ms. Sonia Latchman, and who provided data required for this project. The author is also thankful to members who participated by providing guidance and valuable suggestions during this study. These members are Maj. A.M.D. Cook, Capt. Pratt, Capt Deborah Howe, CWO M. Nobbs, Majr. M.E. Norris, CWO. Alain Carriere, Mr. Alain Berthiaume, CWO Bruce Paradis, and Mr. Larochelle,

References

Bernard JAJ, Villeneuve M., and Laberge M. 2003. The Relationship between Job Satisfaction, Organisational Commitment and Intention to Stay. Director Human Resources Research and Evaluation National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario.

DND (Department of National Defense), 2004 – 05. Annual Report on Regular Force Personnel, Prepared by the Modeling & Workforce Analysis Section Director, Strategic Human Resources (D Strat HR) Chief of Staff – Assistant Deputy Minister (Human Resources – Military)

DND (Department of National Defense), 2002. Military HR Strategy 2020, Facing the People Challenges of the Future. 4 – 05, Catalogue Number: D2-139/2002, ISBN Number: 0-662-66732-8

Dunn, JMA and Majr. Morrow, RMA. 2002. Should I Stay or Should I Go: Attrition Questionnaire Revision Project – Phase 1 Findings. Director Human Resources Research and Evaluation. National Defence Headquarters. Ottawa. Ontario.

Jenkins DA, and Morrow RO. 2003. Voluntary Attrition from the Canadian Forces: Quantitative Analysis of Data from the Revised Canadian Forces Attrition Information Questionnaire. Director Human Resources Research and Evaluation National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario**.**

Morrow RO. And Dunn J. 2002. Development of the Canadian Forces Exit Survey. Director Human Resources Research and Evaluation National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario.

Norton SMA. 2003. Continuous Attitude Surveys and their use by the United Kingdom, Australian and New Zealand Militaries. Director Human Resources Research and Evaluation National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario.

Norton SMA. 2003. The Continuous Attitude Survey: Results of the Needs Analysis. Director Human Resources Research and Evaluation National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario.

Parker, RO. 1990. Preliminary Results from the Canadian Forces Attrition Information Questionnaire. Paper presented at the 32nd Annual Conference of the Military Testing Association, Orange Beach, Alabama, U.S.A., Nov 5-9, 1990.

Parker, RO. 1992. Canadian Forces Attrition Monitoring System: Implementation and Potential. Working Paper 92-I. Willowdale, Ontario: Canadian Forces PersonnelApplied Research Unit.

Urban SMA. 2006. Your-Say Transformation in the Canadian Forces. Director Human Resources Research and Evaluation National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario.

Urban SMA. 2007. “They Said” Results from the Fall 2006 Your-Say Administration. Director Human Resources Research and Evaluation National Defence Headquarters Major-General George R. Pearkes Building Ottawa, Ontario.