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OBSERVING TO LEARNING: A NEW MODEL

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OBSERVING TO LEARNING: A NEW MODEL

AIM

1. The aim of this service paper is to propose to the Commander 1 Canadian Air Division improvements to how the RCAF learns as an organization.

INTRODUCTION

2. The ability to learn as an organization is critical to the efficient and effective use of limited resources and long term organizational health. Organizational learning has been a subject of much research, particularly since the early studies of single loop and double loop learning nearly 40 years ago.[1] Single loop and double loop learning can also be described as corrective and preventative actions. Many programs within the RCAF use this type of learning to continuously improve. However, these programs are typically safety based[2] and singular in purpose and consequently not holistic in nature to the RCAF.

3. The Canadian Forces Aerospace Warfare Centre (CFAWC) was created in 2005 to be a "catalyst for air power development and as a steward for air power knowledge."[3] A few years later, the Air Force Lessons Learned Program (AFLLP) was developed by CFAWC to "establish processes that add value to our existing body of knowledge, or attempt to correct deficiencies in areas of concepts, policy, doctrine, training, equipment or organizations."[4] However, recent air operations have highlighted deficiencies in both air power development and managing air power knowledge. Analysis of the lessons learned (LL) reports, end tour reports (ETRs) and critical

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[1] C. Argyris and D. A. Schön, *Organizational Learning: A Theory of Action Perspective* (Reading, MA: Addison-Wesley, 1978).
[2] For example: Flight Safety, Air Force 9000+ and Airworthiness (both focused on aviation safety), General Safety, Radiation Safety, etc…
[3] "Canadian Forces Aerospace Warfare Centre," last modified 01/12, accessed 02/05, 2016, <a href='http://www.rcaf-arc.forces.gc.ca/en/cf-aerospace-warfare-centre/index.page'.
[4] Ibid.

topics lists (CTL) from recent air operations reveal that there are several lessons that have been observed but not learned. For example, it was observed recently during OP IMPACT that the RCAF needed to improve its targeting capability. This same observation was made three years earlier during OP MOBILE through the AFLLP. Despite the importance of targeting to the projection of air power, the deficiency was not addressed between these two operations. The nature of this learning failure requires further study.

DISCUSSION

4. To begin the analysis some key features of two successful learning programs within the RCAF will be discussed. Following the analysis, the learning failures for OP IMPACT will be discussed and a comparison made between the successful and unsuccessful programs. After the comparison, a proposal will be made to address the AFLLP deficiencies.

RCAF Flight Safety Program

5. The RCAF Flight Safety (FS) Program provides an excellent example of the RCAF's ability to transform information into knowledge. The purpose of the FS Program is to "enhance combat-effectiveness by preventing the accidental loss of aerospace resources."[5] It does this by "quickly identifying effective measures that will either prevent or reduce the risk of similar occurrences."[6] To enable the transformation of information to knowledge, the FS program comprehensively analyzes accident/incident cause factors. After identification of the cause factors, preventative measures are developed to avoid reoccurrence; most often resulting in changes to publications, procedures, training, practices, etc. In terms of knowledge management, the program often transforms information into procedural knowledge. This knowledge is also

[5] Canadian Forces Flight Safety Program, last modified 12/22/2015, accessed 02/05, 2016, www.rcaf-arc.forces.gc.ca/en/flight-safety/index.page.
[6] Ibid.

provided to the chain of command (CoC) and most RCAF air operations personnel on a regular basis through publications and mandatory briefings (assimilative knowledge).[7] As well, the program is run by the Directorate of Flight Safety (DFS) and the entire CoC is responsible for ensuring the program is in place. Furthermore, the CoC and individual squadron members are accountable for implementing (and in many cases identifying) preventative measures. Additionally, a key feature of the program is self-reporting, which is largely enabled by an open culture of safety. The FS program has clear ownership (DFS and CoC), accountability (CoC, individual members), and culture (inherent self-reporting).

RCAF Quality Management Program

6. Although very different from the FS program, the Air Force Quality Management (QM) Program, Air Force 9000 Plus (AF9000+), also enables organizational learning within the RCAF. In this case, learning is enabled by a comprehensive audit cycle by both external and internal auditors to a defined standard. This approach suggests that the learning is more compliance based as opposed to the strong culturally based learning in the FS program. The program is based on the International Standards Organization (ISO) 9000 standard and the Technical Airworthiness Manual (TAM). Discrepancies against the standard as described in airworthiness policy documents are documented, reported and tracked for compliance. Process owners and organizational leadership are responsible to develop both corrective and preventative actions that need to be approved by the auditing agency. Furthermore, the reports are all communicated through the established chains of command (CoC) and inaction or non-compliance can affect both the registration or accreditation status of the organization, potentially ceasing air operations until the corrective or preventative actions are complete. Like the FS

[7] The AFLLP describes six types of knowledge: descriptive, procedural, reasoning, presentation, linguistics and assimilative. Refer to B-GA-005-780/AG-001 page 6-3 for definitions.

program, all observations/incidents are categorized into meaningful categories that allow for more comprehensive analysis. Although, this program is more compliance based than culture based, it still addresses the key aspects of a continuous improvement program of ownership, accountability and culture.

7. Both the FS and AF9000+ program are closed processes. That is, after the observation/incident some analysis is performed both corrective and preventative actions are developed, implemented, and verified. Figure 1 provides an illustration.

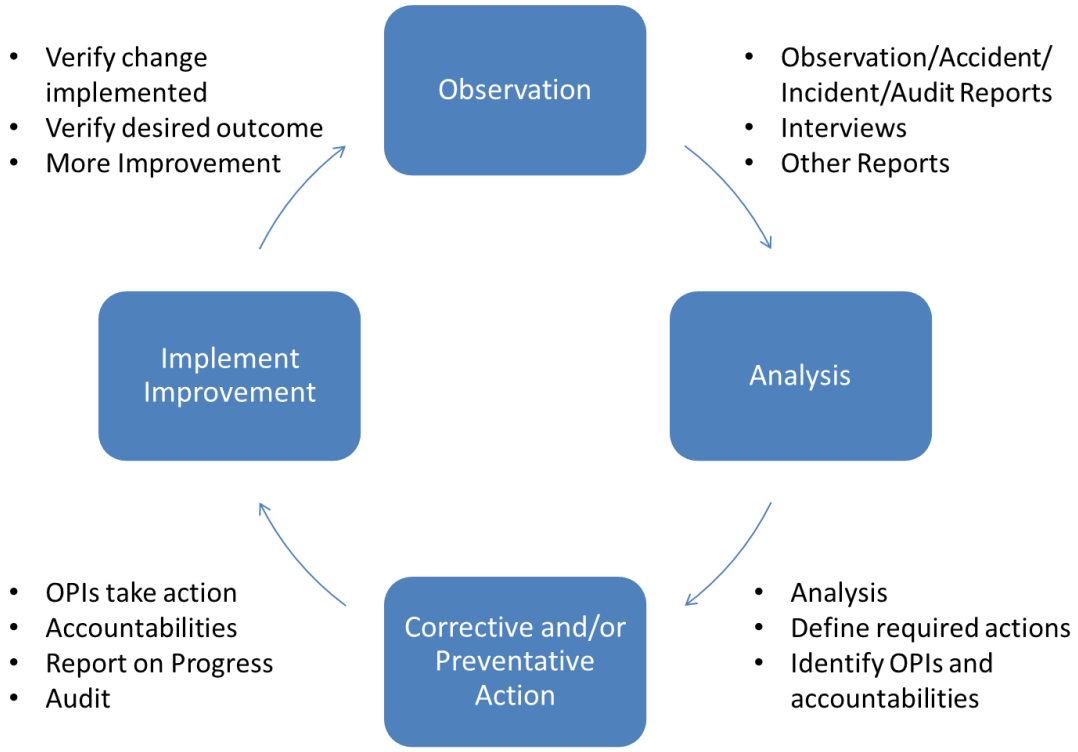

Figure 1. Illustration of Continuous Improvement Cycle

Lessons Learned from OP IMPACT

8. Further analysis of OP IMPACT reveals that learning from past operations is inherently difficult in the RCAF. First, lessons observed from previous operations are difficult to research.

Second, observations from past operations were not considered for planning and activation phases of the operation. Finally, there was no direct way to coherently link or categorize previous observations into something meaningful. Some examples are provided below.

a. Observations and recommendations from past deployments that were relevant to OP IMPACT were not briefed or made available to the recce team lead or the Air Task Force (ATF) Commander prior to the recce;

b. Observations and recommendations from past deployments that were relevant to the Managed Readiness Plan (MRP) for the ATF was not provided to the ATF command team by the 1 CAD Lessons Learned Officer (LLO) who was tasked to the exercise. Furthermore, no lessons learned report from Maple Resolve[8] was generated by the LLO;

c. During Op IMPACT, repeat observations were made without prior knowledge of the past observations or recommendations; and

d. In-theatre research of past observations and recommendations was difficult to perform without a common categorization methodology.

9. These observations suggest that many of the ‘arrows’ in Figure 1 are broken. That is, the observations from past operations and the MRP did not progress to the analysis phase, action plans were not developed, improvements not made, nor any follow up completed.

10. The Canadian Armed Forces (CAF) has invested in a Knowledge Management System (KMS) to facilitate learning from the past; however it is largely used as an information

[8] A training event that forms part of the RCAF MRP.

repository. The distinction between 'information' and 'knowledge' is important – "[i]nformation that provides meaning and value when making decisions or determining action required is considered knowledge."[9] The RCAF uses the Jacob Needleman model[10] to provide further distinction in the form of a pyramid: data; information; knowledge; and wisdom with data at the bottom (foundation) and wisdom at the top (apex). The concept of knowledge is further described in the AFLLP Manual.[11]

11. As currently applied, KMS is largely a misnomer, as it does not currently contribute to air power knowledge in a meaningful way. The reason is not so much the repository itself, but what is done with the information. Who has ownership of the information? Who is accountable for transforming information from past operations into knowledge? Why is the concept of adding value (continuous improvement) to air operations not understood and inherent in the RCAF? Until the issues of ownership, accountability and culture are addressed the AFLLP will continue to fail to take flight. Some insight into successful learning program within the RCAF may help address this deficiency.

12. Comparing the AFLLP to the FS and QM programs reveals the following:

a. Ownership. Nobody has ownership of the observations after the ETR or other reports are written. The report goes into a 'black hole' with the expectation that leaders and RCAF personnel will 'pull' information from KMS – this is fundamentally flawed. This contrasts with both the FS and QM programs where

[9] Canada. Dept. of National Defence, *B-GA-005-780/AG-001 Air Force Lessons Learned Programme Manual*, 2010), 6-3.
[10] The Jacob Needleman model is the model used to describe the knowledge hierarchy in Air Force Lessons Learned Programme (AFLLP) Manual (B-GA-005-780/AG-001)
[11] Refer to B-GA-005-780/AG-001 page 6-3 for definitions and further explanations.

ownership of the programs is clear and generally understood. As well, in both the FS and QM programs there is buy-in at the junior officer and Sr NCM levels, as they are typically involved in recommending the corrective and preventative measures. This is not happening with the AFLLP.

b. There is no accountability for the LL program. Observations raised as a result of QM and FS programs hold the commander accountable to higher CoC and an auditing agency. Corrective and Preventative actions are documented, verifiable, and approved by both the CoC and auditing agency. The AFLLP program attempts to create a line of accountability outside of the existing CoC. As a result, there is little accountability for observations made through the AFLLP.

c. The FS and QM programs generally have a good culture. They have a good culture because people believe in the system, have taken part in continuous improvement themselves, and/or have seen firsthand 'verifiable successes. Without 'verifiable successes,' it is difficult for people to buy-in to the AFLLP.

13. The AFLLP needs to step beyond singular function continuous improvement programs to meets its air power development objective. However, to step beyond the singular nature of these programs a higher level model needs to be considered. A model that takes into consideration: RCAF doctrine; training institutions; operations; and observations for continuous improvement. A review of RCAF doctrine as described in the B-GA-400 series of publications indicates very few linkages of lessons learned to aerospace doctrine. In fact, a few of the publications are devoid of reference to lessons learned. Recent training as per the RCAF Managed Readiness Plan (MRP) indicates that RCAF doctrine is being applied to training and being used in

operations with the recent implementation of the Air Task Force (ATF) concept. However, RCAF doctrine is not congruent with Canadian Armed Forces (CAF) doctrine with respect to the Joint Task Force (JTF) concept, suggesting that a review of both Joint and Aerospace doctrine is required.

14. Coincidently, the Canadian Army (CA) has recently studied experimental learning within the CA to look for opportunities to improve the CA's current Doctrine-Training-Operations-Lessons Observed cycle (D-T-O-LO). [12]In his study, LCol Gasparotto begins the analysis with the introduction of the Kolb learning cycle[13] which is comprised of four stages: "concrete experience, reflective observation, abstract conceptualization and active experimentation."[14] These stages are similar in nature to the continuous improvement stages proposed in Figure 1 and the D-T-O-LO loop (Figure 2). He also provides a literature review and analysis of learning types and experimental learning theory, organizational culture, and learning organizations. With this understanding, he then investigates the following four questions:

1. What are the theories-in-use with respect to the D-T-O-LO cycle?
2. What role does organization culture play in how the D-T-O-LO cycle is completed?
3. What are the barriers and enablers that impact the completion of the D-T-O-LO cycle?

[12] Mark Gasparotto, "Experimental Learning in the Canadian Army: Evolving from a Training to a Learning Organization" (Master of Arts in Leadership, Royal Roads Military College).
[13] D. Kolb, *Experimental Learning: Experience as a Source of Learning and Development* (Englewoods Cliffs, NJ: Prentice Hall, 1984).
[14] Gasparotto, *Experimental Learning in the Canadian Army: Evolving from a Training to a Learning Organization*, 23.

4. How can Experimental Learning Theory and learning organizations best practices inform the implementation strategies to improve the CA's learning effectiveness?[15]

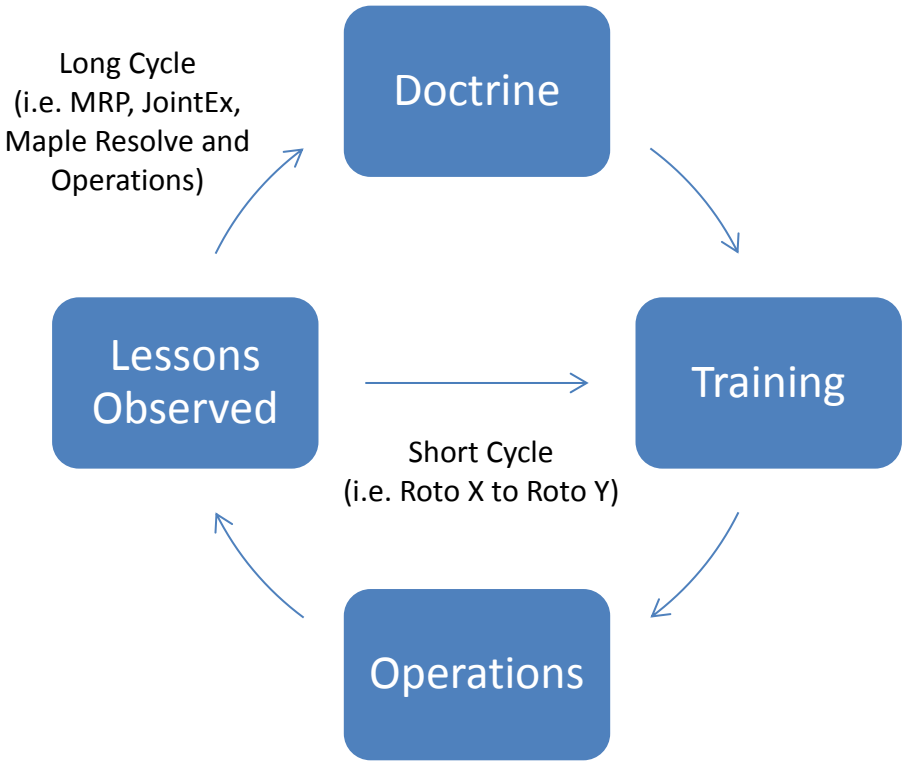

Figure 2. Modified Visualization of D-T-O-LO cycle (modified to reflect RCAF requirements)[16]

Source: Adapted from Gasparotto, Experimental Learning in the Canadian Army: Evolving from a Training to a Learning Organization.

15. These questions are also relevant to the RCAF as the answers would help explain the 'broken arrows' that were recently discovered in MRP and while preparing for OP IMPACT.

[15] Ibid., 45.
[16] In this proposed model the short cycle reflects Roto-to-Roto learning, whereas the long cycle reflects annual and operation-to-operation learning.

16. From the study, LCol Gasparotto drew six conclusions of which five are relevant to the RCAF:

a. "The links to and from Doctrine are the D-T-O-LO's cycle's weakest[.]"[17] Within the RCAF, there is no formal means or established practice to look for differences between what we do and our doctrine. The continued lack of targeting capability and incongruences between the ATF and JTF doctrinal concepts suggest that the RCAF would benefit from strengthening LO-D and D-T links;

b. "Aspects of CA culture impede learning organization best practices[.]"[18] As highlighted in the discussion, there are some cultural successes within the RCAF. However, these successes are limited to stand-alone programs that are primarily safety based. The RCAF has not yet achieved a culture of continuous improvement to the air operations and the MRP. As well, the RCAF may need to look beyond aerospace doctrine to truly embrace joint operations;

c. "Leadership must play a role in supporting the D-T-O-LO's cycle's current and future structures and processes[.]"[19]Although ownership and accountability are clear and effective for the stand-alone safety based programs they are neither clear nor effective holistically for the RCAF. The AFLLP as currently implemented is awkward as it attempts to create lines of accountability outside established CoC;

d. "How educating the force and modernizing knowledge management and information technology can unveil the 'unknown knowns' [sic] (i.e. information

[17] Ibid., 4.
[18] Ibid.
[19] Ibid.

that exists but is not easily accessible by the entire organization)[.]"[20] As discussed the current use of KMS does not effectively contribute to the continuous improvement loop. A better means to draw out observations from operations and training and transforming them into lessons learned is required. The RCAF can look inwards for examples; both the FS Program and QM Program; and

e. "The AAR [After Action Report] process works and performs a crucial learning function."[21] The RCAF would benefit from a more structured and culturally accepted means of analyzing training events and operations similar to the CA.

CONCLUSION

17. This paper started with the concept of organizational learning and introduced the Aerospace Warfare Centre (CFWAC) as a steward of air power knowledge and the AFLLP as a pan-RCAF learning program that establishes processes that add value to the existing body of air power knowledge. Recent operations, however, have identified deficiencies in these processes. To help gain insight into how processes can add value to a knowledge base two successful continuous improvement programs were briefly examined using ownership, accountability and culture as the criteria. The AFLLP was determined to be unclear and lacking in these areas as compared to the other programs. Further analysis revealed that there needs to be a better means to link RCAF doctrine to training and operations in order to learn from these experiences and to do better next time.

[20] Ibid.
[21] Ibid.

18. The CA has recently assessed itself as a learning organization and drew five conclusions that are relevant to the RCAF: the links to and from doctrine; culture; leadership; education; and the AAR process. The RCAF would benefit from further analysis of these conclusions to allow for improved stewardship of air power knowledge and the processes in which to accomplish this objective.

RECOMMENDATIONS

19. Recommendation 1. Similar to the CA, the strength of the links between Doctrine, Training, Operations and Lessons Observed should be assessed. The work done by LCol Gasparotto provides a template on how this can be accomplished.

20. Recommendation 2. The role of the AFLLP within the D-T-O-LO construct should be analyzed to address the key features of ownership, accountability, and culture. The RCAF can look inwards for successful examples, namely the FS and the QM Programs.

21. Recommendation 3. The relationship between KMS, the D-T-O-LO cycle and the AFLLP program should be analyzed. KMS as currently implemented is more of an 'information' management system vice a 'knowledge' management system. As a result it does not effectively contribute to RCAF learning.

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