THE MALTESE CROSS

Long recognized as the universal symbol of the Fire Service, the origin of the Maltese Cross is shrouded in antiquity.

During the time of the Crusades, a band of Knights of Saint John fought the Saracens for possession of the Holy Land, and while doing so they encountered a new weapon - the Saracens weapon was fire. As the Crusaders would advance on the walls of an enemy fortification, they were struck by glass bombs containing naphtha. When they became saturated with the highly flammable liquid, a flaming tree was hurled into their midst by the Saracens. Many Knights were burnt alive or sustained savage burns to their bodies. Others risked their lives to save their comrades from a painful death. The efforts of these brave men was recognized by their fellow Crusaders who awarded each of these selfless hero's a badge of honour, a cross, similar to the one worn by today's fire fighters.

The Knights of Saint John were from a small island located in the Mediterranean named Malta. The cross that they so proudly wore became known as the Maltese Cross. From that time to the present the Maltese Cross has been known as a symbol that identified protection, for all who saw it were aware that its bearer was willing to lay down his life in order to protect his fellow man. This symbolism is the reason for its adoption by the fire service and is as representative today as it was in days gone by. The Maltese Cross is the fire fighters badge of honour, signifying that they work with courage to safeguard those they have sworn to protect.

THE MALTESE CROSS

A SYMBOL OF PROTECTION AND HONOUR

INTRODUCTION

The following pages will attempt to chronicle the history of the fire service within the Canadian Military, the period covered is from the beginning of the First World War to the early 1980's. This exercise has proven to be very rewarding to this writer as no doubt it will be to those who take the time to peruse its pages.

The military fire service is a far more complex topic than is immediately apparent, principally, because of its multi-faceted role within the three-armed services and the variety of tasks performed by individual fire fighters. For there are those who constitute an integral part of the armed forces (military) and the civilian fire fighters who work directly for the military. These duties, which fall under the common title of fire fighter, are often fundamentally different in both operation and equipment. The differences spring from the environment the individual fire fighter happens to find himself in, varying from airfield crash fire fighting, shipboard fire fighting to structural duties on a static base. In some cases there could be a combination of assignments which demand more than one type of employment. For instance, crash rescue and structural fire fighting duties are carried out by fire fighters cross manning structural and crash vehicles. Regardless, all duties conducted by fire fighters are important in their own right, whether they are executed in either a multi-faceted or single occupational role. Nevertheless, there remains something of a divergence with regard to employment tasks, that at times are difficult to draw together under one umbrella.

This is basically a rags to riches documentation, of what was in the past, a Cinderella military occupation. It begins with poor equipment, poorly trained personnel, meagre resources and an image that could at be best described as humble. Nevertheless, the military firefighter has risen in stature to a point where he is now regarded among the best trained professionals in today's military. High-tech apparatus and advanced professional training has replaced the crude equipment and rudementary training that was his lot in earlier less estimable times. The credit for the progress made, is due chiefly to the tireless efforts of dedicated firefighters of all ranks who have worked diligently throughout the years to improve the firefighter's professional skill, efficiency and image.

The more informed reader, particularly those who served through the actual events described in this narrative will, no doubt, find cause to challenge some of the dates contained in this manuscript. To them, all that can be said in defence of this writer is that there has been a genuine effort to record the facts as accurately as possible. To be fair, it must be viewed with due respect to the limited documentation left to describe the circumstances. Please try to remember that exact dates etc, generally do not change or detract from the facts surrounding the incident. With the foregoing in mind and in an effort to avoid unnecessary controversy, pains have been taken to avoid the indiscriminate use of individuals names except of course when they are inextricably entwined with the actual event being described. This approach also reduces the risk of conferring credit erroneously, or where there may be several individuals of the opinion that they were in fact the driving force behind the procurement of a particular piece of equipment, or instrumental in achieving some other milestone worthy of special recognition.

Perhaps it would be prudent at this time to acknowledge the three previous attempts to write the Canadian Forces Fire Service history and which in large part are responsible for the information contained in the following pages. The first, was an introspective narrative of Major Phil. Brown's experiences in the wartime RCAF, both as a pilot and later as a fire protection officer. The second is an account by Flight Lieutenant Johnny Cowell who describes some of the significant milestones of the fire services development including personnel and equipment and is liberally

flavoured with personal anecdotes. The third and final attempt, albeit an incomplete version, was written by Captain G. Cowan whose account draws to heavily on the two previously mentioned attempts. To all three, the military fire service owes a debt of gratitude for attempting to preserve the past. For the record it should be noted that there has been no official publication or publishers edition of any of the foregoing. Certainly an additional wealth of information has been gleaned from other sources including the National Archives, National Defence and other historical publications. Special mention must be given to the people who unselfishly provided information, photographs and encouragement. Finally, many thanks to Major Gary Mauch without who's determination, persistence and encouragement this document would never have been written. To everyone else who contributed in one form or another, many thanks. To those who will merely read this document thanks also.

In conclusion, the goal of this narrative was to complete an all encompassing document of the history of the Canadian Miliary Fire Fighter. One of the predominant problems associated with this assignment has been the lack of written documentation on the development of a fire service within the Canadian Military, a fact that should be borne in mind by the reader. However, although much care has been taken to be as historically correct as possible, some of the inferences drawn and opinions expressed are inevitably those of the author. No apology is offered, it is a consequence all historical accounts are destined to suffer.

I sincerely hope that the following pages will interest not only the military fire fighter, but also those who wish they were.

E.J. Evans

Captain

Air Command Headquarters

Winnipeg, 1993.

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HISTORY OF THE CANADIAN MILITARY FIRE SERVICE

THE FIRST WORLD WAR ERA

The existence of a fire service within the Canadian Military has been a reality since the First World War. Nevertheless, documentation describing early operations are sketchy and very difficult to chronicle with the degree of accuracy and detail they rightfully deserve. This is particularly true of its formative years and is mentioned here only to allay concerns that an injustice has been apportioned this period.

The fire services reason-for-being is primarily to provide protection to life and property from the ravages of fire. The military firefighter however, is also subject to the complexities of military ethos that can conflict with his professional ideology. For instance; members of the Military Medical Corps who share the firefighter's commitment to protect life, are forbidden by convention to take up arms. The military firefighter by contrast, is expected to take up arms when the situation dictates. His personal and professional code of conduct consequently, is driven by military expediencies rather than an exclusive fire service code of behaviour. Philosophically, the military firefighter has never been hidebound or subject to some of the traditional fire departments inertia resistance to change. The foregoing factors, plus the fact that the military firefighter has been charged with supporting military operational requirements, have provided the necessary diversity that make the military firefighter unique.

In the Beginning

Although written records of fire services during the First World War are scarce, there are nevertheless limited documentation that authenticates the existences of an organized military fire brigade. The earliest photographic record (circa 1918) of uniformed military firefighters illustrates personnel on duty at Camp Borden. Written documentation has been researched mainly from regulations, orders and periodicals that were in existence at the time.

The first phase of the history of the military firefighter has a direct association with the development of British Flying Services in Canada, particularly in Camp Borden.

On a wintry day in 1917 Lieutenant-Colonel (later Brigadier-General) Cuthbert G. Hoare of the Royal Flying Corps selected Camp Borden as the site for what was to become the senior station of the Royal Canadian Air Force. The Camp's isolated location (at that time) and the need to be self reliant with regard to fire protection may have been instrumental in stimulating the beginnings of the Canadian Military Fire Service. Divided into two distinct and separate functions, the fire brigades duties included aircraft crash responses and structural fire fighting.

RFC/RNAS/ Organization

Development of the fire brigade organization at Camp Borden during the war years was no doubt given impetus by the presence of many aircraft and the highly flammable fuel that powered them. The Royal Naval Air Service (RNAS) and the Royal Flying Corps (RFC) were joint developers of the camp, both had a vested interest in protecting the expensive infrastructure. Their intention was to train Commonwealth pilots at the camp who were badly needed for duty in the European theatre. Pilots trained at Borden would ultimately fight in a war that was taking place over the battle fields of Europe, Asia, and Africa and above the adjoining seas. Canadians would eventually play a prominent part in the aerial conflict.

Construction Begins

Aircraft hangers were constructed within six weeks of Hoares' initial inspection. Personnel quarters too, were simultaneously built with sufficient accommodation to permit a training squadron to form and start assembling its aircraft. In just four months the contractors had erected fifty-seven buildings, cleared and levelled 850 acres and sowed the ground with grass seed, built five miles of asphalt road and laid additional sewage pipes and rail sidings. They had installed an electrical system and strung telephone lines to connect the field with Toronto and neighbouring towns. So successful was this method of development that it became the construction standard for later fields. So rapid was the Camp's progress that Hoare, in a report to the War Office, observed that "the work appears to be put through at a speed here which is unknown in England."

By wars end, Camp Borden was recognized by many aviation experts as one of the most up-to-date aviation training facilities in the world. Quite a flattering endorsement considering the speed with which the installation was constructed.

Materials used in building the aircraft hangars and repair buildings was chiefly wood or other combustible material. Concern regarding the density and combustibility of the material prompted the RFC (who were more familiar with non-combustible European construction methods) to establish an on-site structural fire brigade. Perhaps these fears were not without substance, of the original seventeen hangars several were later destroyed by fire. Nevertheless, to the builders credit, most of these `temporary' wartime structures are still providing useful service some 75 years later, two of them by the Canadian Forces Fire Academy (CFFA)! However, the forces of time and nature, are steadily taking a toll of those remaining. Soon, there will be only a symbolic structure (hangar) preserved for historical reasons. There is something of an irony here, for the specifications spelled out by Lieutenant-Colonel Hoare was that the buildings at Borden were to be of "semi-permanent nature" and he arranged for "the cheapest form of construction possible compatible with strength...."

Aircraft Accident Statistics

Aircraft accident statistics sent by RCF/RAF Canada headquarters to the War Office exist only for the period April 1917-May 1918 (Ref 93). Camp Borden figures indicate there were 49 aircraft accidents and 30 fatalities, figures that clearly indicate the need for aircraft rescue and fire fighting services. Not recorded are similar records of structural fire occurrences.

The emergence of an organized military fire brigade at Camp Borden was a noteworthy event, because it helped set the stage for the fire service to become an integral part of future military organizations.

Early Methods of Fire Prevention

Control of fire losses on military installations during this period were in large part due to the application of personnel discipline, stringent adherence to regulations and their zealous enforcement. These directions are spelled out in no uncertain terms in the Army Fire Regulations Manual, 1916 edition.

The foregoing fire prevention measures might appear primitive compared to the way they are conducted by today's DND fire departments, however they proved sensible and effective.

The fire crews of the era were drawn from General Duties personnel (GD) and included personnel from a variety of other trades performing the obligatory extra duties. A normal characteristic of military life in those days was to demand virtually all personnel to perform additional duties and to carry them out without complaint or question. Carrying out extra duties applied to most repetitive tasks that helped the military machine function. Duties that ranged from helping to prepare food in the respective messes and conducting security assignments.

Organization

The organization of manpower for fire fighting (fire piquet) may have differed slightly from unit to unit, but they would have to conform in large part to the various regulatory manuals. Kings Regulations for the Canadian Army and The Fire Services Manual for the Canadian Army, afforded the cornerstones for day-to-day routines. The relative importance (size) of the individual installation dictated the type of fire fighting equipment that it would have assigned to its inventory. Therefore, the operation and deployment of fire equipment and vehicles would have differed from unit to unit. In many instances distance and/or isolation from the nearest organized established community was also a factor.

Despite the advances made in regard to fire fighting equipment and personnel expertise, the practice of employing a fire piquet to augment fire fighting personnel continued well into the 1970`s. In reality a form of fire piquet still survives today as Volunteer firemen.

It is worth remembering that during this time the battlefields of Europe consumed manpower at an alarming rate, and the demand for able bodied men for front line duty had reached epic proportions. Therefore, unless you were actually fighting in Europe or training to fight, your influence in the 1914-18 overall scheme of operations was something less than significant. Consequently, the luxury of having a full time force dedicated to fire fighting operations had to wait until manpower availability improved and the hazards of fire became a significant threat to operations.

The need to set up a distinct military trade to be employed in the fire service became clear with the development of large Second World War aircraft, and their enormous fuel supplies. Naval and army supply depots containing large quantities of munitions and vital war material warehouses also demanded on-site fire protection. Not surprisingly, as aviation technology advanced so did the need to improve fire fighting skills and aircraft crash fire fighting equipment.

On the army and naval side of operations, fires in buildings housing essential war material necessitated advances in structural fire fighting techniques and improved apparatus performance. Using these new requirements as building blocks, superior proficiency in all aspects of the fire fighting service was steadily being achieved, particularly during the 1939-45 war years.

Vehicles and Operations pre-1939 to 1940

Operationally, there would have been local unit variations with regard to fire fighting response procedures, depending on the experience of the individual in charge of the department. Training of non-professional fire crews was carried out on site or by instruction from personnel from local fire brigades. Instruction, which would no doubt reflect the particular prejudices of the trainers with regard to fire fighting methods or techniques. However, it might be prudent to say that the roots of the fire service would have been vested in the consciousness of the senior firefighters of that time. The science of fighting fires was not well developed in those days but the effects of fire were well known. Water in copious quantities, was the basic principal applied to fighting fires regardless of size. General duty personnel (GD's) were able to learn the basic rudiments of

fire fighting quickly so they became a natural pool of readily available manpower. Containing fire spread was the philosophy followed, with little appreciation or even the perceived need to take the fire service beyond the established level. In retrospect, and with due regard to the limitations placed on them, those personnel who performed fire fighting duties in those early days should be given a solid vote of thanks.

Fire fighting vehicles would be operated by professional drivers on loan from the Transportation Section, as was the case at the start of the Second World War. In fact, the use of transport drivers to operate fire vehicles versus firefighter's, was a hot topic of discussion at Fire Prevention Officers Conference in 1941, where they unanimously agreed to recommend that firefighters take over sole responsibility for this duty. The rest of the response crew drawn was from the duty fire piquet. Without question, the instruction given would have been rudimentary, with little resemblance to today's demanding training requirements, where military and civil service firefighters are given a thorough schooling in basic and advanced fire fighting training.

Vehicles of 1914-18 vintage and their fire fighting packages were primitive by today's standards. Never-the-less they were capable of pumping a respectable 325-350 imperial gallons per minute (gpm), using the model of the day, a rotary gear type pump. These pumps operated on a positive displacement principle that although effective, would occasionally develop serious problems if discharge orifices became obstructed or blocked during pumping operations. Centrifugal pumps would not become the fire service standard for a few more years. There were centrifugal pumps installed in stationary pump houses however, these were too large to mount on mobile equipment.

The principal problems facing a fire brigade (early 1939 the term brigade was dropped in favour of department) response crew dispatched to fight a large fire in 1918, would stem from marginal or unreliable water supplies. In addition they had to deal with limited pump capacity and hose lines that were inclined to burst at the most inappropriate time. These problems and a myriad of other equipment difficulties made the chances of successfully extinguishing even a modest fire, a formidable task. Eventually hose standards improved and testing procedures were incorporated into on site training exercises. Techniques of combating and controlling fires were largely confined to "putting the wet stuff on the red stuff" and liberal servings of the time tested surround and drown tactics.

Extinguishing Agents

Continual advances were made in the development of fire fighting equipment and extinguishants, but some of the more sophisticated fire suppression chemicals had yet to make their appearance. Never-the-less, the highly efficient, albeit toxic, carbon tetrachloride was available (forerunner and close relative of the halogenated extinguishing agents) as was carbon dioxide (CO_2). Use of

these agents was invariably confined to fire extinguishers. Still, it was water usually delivered in copious quantities that provided the mainstay for most fire fighting operations.

Most of the available information of these early years (limited as it is) has come from Camp Borden. Other air force units that operated during these years would have in all likelihood carried out their day-to-day operations along comparable lines depending on their equipment and local know-how available. Fire fighting equipment inventories would have undeniably varied, some stations having only hose reel carts as their primary response apparatus. In fact, only three (pre 1939) stations had their own motorized fire vehicles. The remainder "made do." A somewhat detached reader might get the impression that having a fire department dedicated to a military unit was something of a luxury!

The concept of using hose reel carts for fire fighting may appear old-fashioned to the younger firefighter. Regardless, they remained in service until the late 1970's. This writer can recall times in the sixties when they were in use at a nuclear capable missile installation. This occurred when our sole pumper was briefly out of service, proof positive of the enduring qualities of this venerable piece of equipment. Its spirited use may have provided early inspiration for the firefighter physical fitness testing program!

Early methods of operations placed considerable reliance on the local municipal fire department, available to provide assistance for an on-site fire. Slowing the progress of the fire and protecting the immediate exposures, became the main objective of the stations fire response. This too was a topic for the Fire Prevention Officers meeting of May 25 1941, when members were advised to warn fire chiefs not to become too dependent on local municipal fire departments in their area.

The Army and Navy Fire Services

Before 1914, organization of the army and the navy fire service (land based) was organized and operated in much the same fashion as that of the air force.

Whether on board HMC ships at sea or in harbour, fire fighting responsibility was in the hands of the Engineering Branch (Stokers), supported by damage control personnel. During non-working hours safety of the ships rested with the Officer-of-the-Watch supported by Duty Watch personnel. Duty Watch personnel were supplied by various divisions within the ships company.

Naval shore establishments, other than the Esquimault and Halifax Dockyards functioned as "ships ashore" in operation and designation bearing the HMCS preface such as HMCS Stadacona, HMCS Naden etc. Similar to the ships the land units also maintained an Officer-of-the-Day (watch) supported by Duty Watch personnel. However, because the two Main dockyards were basically manned by civilians the duty watch personnel (if there was one) came from docked naval ships. Senior management at the dockyard invariably consisted of RCN Officers therefore, the practice of appointing a Officer-of-the-Day was universally established.

Whilst the RCN shore establishments in Halifax were within the area protected by the City of Halifax Fire Department, Esquimault facilities lacked a perimeter professional fire department. As a result, a monetary arrangement was formulated with the City of Victoria to provide fire protection service. Despite a response run of some eight to ten miles.

Although the arrangement made with the City of Victoria was far from the desired solution it did work out for the period in question. The two main reasons for its success were first, the shore establishments were constructed largely of non-combustible brick and were well separated from each other. Second, the naval occupants due to their strict sea training were very fire conscious.

Although much of the naval fire fighting services were almost exclusively directed toward fire on-board ships. Fire fighting activities when the ship was dockside would be treated as a shipboard fire with the same kind of crew response that would occur at sea. Manpower and equipment limitations notwithstanding.

The army's fire safety bible followed the principles outlined in the British Armies Fire Manual for Hutment Camps and the Army Fire Manual. The earliest obtainable editions of these manuals were dated 1916, although there was no doubt there are earlier editions. The manuals placed emphasis on; "discipline, order, the proper training of piquet's and constant patrol inspections and the complete readiness of equipment." Good policies that, when judiciously applied would be certain to reduce fire losses even in today's sophisticated times. It was possibly the effectiveness of these measures that permitted the authorities to believe that a professional fire department was not absolutely necessary. Financial and manpower restrictions would have also played a significant role in postponement of stand-alone professional fire departments. Ironically, delay of new programs intended to upgrade individual and collective fire departments are more likely when successful fire prevention programs are in place. Even today, it takes a major fire or other disaster to loosen the bureaucratic purse strings. It is fundamentally certain that policy makers who control fire department budgets, believe that no fire losses equal no fire protection gains.

This reticent attitude toward fire protection expenditure still persists. An example occurred in CFE, where years of petitioning for the installation of foam fire suppression systems in the hangars had fallen largely on deaf ears. A fire swept through a maintenance hangar destroying several aircraft then, predictably, there was a complete change of attitude.

Thereafter, representations made by fire officers for the installation of fire protection and alarm systems in aircraft hangers became one of the easiest

sales in town!

BETWEEN THE WARS:1919-1937

The Royal Canadian Air Force (RCAF) came into official being on the first day of April 1924 when Kings Regulations and Orders for the Royal Canadian Air Force were promulgated. As luck would have it the official birthday of the RCAF fell April Fools Day!

Under the new organization, the RCAF was administered by a senior air officer who was responsible to the Chief of the General Staff of the Army. This situation existed until 1938 when the air force became a separate organization with a Chief of the Air Staff (CAS) directly responsible to the Minister of National Defence. Air Vice Marshal Croil became the first CAS on 15 November 1938.

The fledgling air force operated stations at Vancouver, High River, Winnipeg, Camp Borden, Ottawa and Dartmouth. Although there had been a dedicated airfield and structural fire service during the First World War, from 1924 until 1939, there was no organization within the Canadian Military that could be called a legitimate fire service.

From 1920 until the start of the Second World War, RCAF Stations were in large part responsible for development of their own fire protection. Airmen were assigned fire piquet duties on a regular basis to help meet these responsibilities. Only three pre-war RCAF stations had fire trucks, the remainder relied on hose reel carts and extinguishers. These were augmented by fire extinguishers and the occasional forty gallon foam extinguisher (customarily reserved for locations where quantities of flammable liquids were stored). Of course, local municipal fire services would be called upon when needed to supplement a stations fire fighting capability.

Force Reduction

The period between the wars passed with little noticeable changes or improvement to the military fire service. An understandable situation considering the severe reductions experienced by the armed forces as a whole. Manpower and funds slashed to a point where the continued very existence of the forces seemed threatened. Politicians rhetoric of the day illuminates the prevalent attitudes. Henri Be'land (noted federal politician of the day) expressed scepticism of the commercial and scientific applications of aviation in Canada, and his determination not to vote any money for military purposes; "the war is over," he declared, "and the Government should put a stop to these expenditures." His leader agreed; "to enter this year," Mackenzie King remarked, "before the work of demobilisation is completed, upon an air service for military purposes is the height of absurdity ... We can well afford to dispense with the military end of it this year (and) I think that we shall reduce the vote for air services by $800,000." This proposal carried in the House of Commons by a vote of 46 to 26. Greatly affected was the newly formed RCAF with an establishment of only 68 officers and 307 men spread from Dartmouth to Vancouver, having to define its role as an important military arm in an era of peace. New programs with the exception of new aircraft procurement, were cut to the bone in an effort to maintain the existing forces viability. The army and navy also suffered, they had to make their financial allotments go

further, achieving more with less. The political will to maintain the armed forces at a sizeable level of manpower just did not exist during this period.

Politicians of the time had readily succumbed to the belief that Canada had taken part in the victorious crusade to win the "War to end all Wars," and therefore was justified in settling down to a well deserved period of peace." There is no world menace" declared the Leader of the Opposition during a 1920 House of Commons debate on military expenditures. It was a cry heard often among all politicians of every stripe immediately after the First World War. This was not an altogether unreasonable position, given that most informed persons of the time would not have predicted that Germany would again take the road to war.

Before further force reductions occurred the air force conducted many useful services including; photographic surveys of the North, forest fire patrols and even delivering Treaty Money to the Indian reserves. All these services would be cut with the introduction of further financial restraints. The air force barely survived. Then, miraculously, in 1935 the military appropriation was boosted and the manpower establishment was allowed to increase substantially.

The Army Fire Service

The treatment the Army Fire Service received during the period between the wars was in most respects comparable to the air force experience. Stringent budgetary restrictions driving all other considerations. To the army's credit its authorities were conscious of the dangers involved in overlooking fire safety. They sought to compensate for the lack of a full-time professional fire department by mandating the conscientious enforcement of strict regulations. Every camp had a fire committee that organized the fire prevention program, framed fire orders, delegated inspections of fire equipment and the conduct of fire drills.

The Regulations for the Army Fire Services defined the responsibilities of the fire piquet and fire parties in close detail. Hose carts, fire extinguishers, (particularly buckets) were the order of the day. Enforcement of fire regulations, the cleanliness of the quarters and the traditional "good order" served the army's fire protection efforts satisfactorily in the intervening years.

The Naval Fire Service

The Naval Fire Services weathered this period no better than the other two services. At sea, the suppression of an outbreak of fire normally would fall to the ships damage control team and it was the accepted practice that the entire ships company would turn out to aid fire fighting operations. This was an understandable attitude given the limited options open to the crew should a fire get out of control. Fire fighting operations when the ship was docked were generally assigned to the duty watch of the individual ship or the dockside fire response crew. Of course other ships crew members that happened to be in port would have been recruited to lend a hand, at least until the arrival of the dockside or local municipal fire department. In fairness, it

should be pointed out that losses or damage to ships tied up in harbour were uncommon. Therefore, providing increased fire protection given the low losses, simply would have been too hard to sell.

In review, the fire services of the three arms of the forces were in a rudimentary state just before the Second World War, lacking adequate equipment and a practical training program. Perhaps more importantly they did not have representation to advance their cause through the corridors of power in each of their respective headquarters. The inability of some military leaders to appreciate the long term effects of fire on military operations complicated an already worrisome situation. Even if they had, budgetary restraints and lack of manpower would have provided substantial roadblocks to the advancement of the fire service.

The negative influence major fire losses would have on the overall military picture would not become apparent until the start of the Second World War. Senior civilian fire officials were left with the difficult job of convincing military leaders of the potential for losses of vital war material and the possible negative effects on the war effort. A constant flow of depositions from professionals such as the Dominion Fire Marshal and the Ontario Fire Marshal, eventually convinced them.

The Air Force Fire Service

It was the practice of the RCAF Station Commanding Officer to appoint a Station Fire Chief from the staff of his commissioned officers. One appointee of note was Flight Lieutenant R. Slemon, who later rose to the rank of Air Marshal. Describing fire drills at Camp Borden in the 30's Charles Armstrong wrote "I was a member of the fire crew for a number of months my duty was to connect the hose to the fire hydrant and turn on the water. When I was on the fire crew our fire chief was Flight Lieutenant Slemon, later to become an Air Marshal and went on to become Chief of the Air Staff". It would perhaps be fair to explain that this appointment was regarded by most officers of the day as an extra duty and therefore its award generated little elation from the recipient. The assignment of officers with negligible fire fighting experience to head the station fire department, perhaps characterizes the indifferent attitude with which the military fire services of the time were regarded.

Continuing with another portion of Charles Armstrongs' letter: "Following the large cut in strength in 1932 the Station was closed for the month of July. One fire crew was on duty for 24 hours a day for two weeks and then another crew took over for the next two. I was on the first two weeks, our mess had closed down so we had to eat at the Army Signals Mess. We had to stay with or near our truck so the normal routine was to rise in the morning, get cleaned up and dressed, then all on board the fire truck for the trip to the Signals Mess. This procedure of taking the truck to the mess was repeated for each meal. During the afternoon we could take the truck down to the swimming pool for a dip, or to the ball diamond for a ball game. We had a nine man crew and thus we could make up one full team, no spares, no coaches, but it did help pass the time and made good entertainment for us." The preceding gives something of an insight into the sorry state of the post war fire service.

Official indifference with regard to the fire service was tolerated because the fire service had yet to form its own cadre of officers. Men, who in the fullness of time, would be capable of raising the level of fire protection consciousness in higher military circles.

There were several fires of singular importance during this period, in February 1930 the Officers and Airman's messes at Camp Borden, burned to the ground. This fire was closely followed by the distruction of a barrack block, no lives were lost. This distruction unfortunately, was not of sufficient magnitude to influence immediate improvements in fire protection quality.

The heightened threat of war and the newly acquired awareness for the potential for losses of important war material through fire, prompted the whole strategic approach to military fire services to be revisited. This new sensitivity towards fire protection caused an in-depth reappraisal of military fire protection services to take place, civilian fire authorities formed the vanguard for change. The wheels of progress were inexorably gathering momentum.

NAVAL FIRE PROTECTION

Prior to the beginning of World War II, the fire fighting dockside capability was the responsibility of the Royal Canadian Engineers (RCE). This situation was presumably the outcome of the RCE being responsible for construction and maintenance of all shore billets. The advisor for fire safety was a Captain P.C. Ahern, RCE who would have been the equivalent of a present day Fire Marshal (without the qualifications). In 1939, the Navy's dockside fire fighting capability still rested with the shore billet volunteer service, duty watch and the local municipal fire department. It was not until 1942, the Naval Fire Service (land based) began to take shape and eventually accepted complete responsibility for dockside fire protection.

Dockside Fire Inspections

The naval organized fire protection services, consisted of Duty Watch (fire piquet) and a designated driver/operator - these personnel would form a first response unit. Indifferent attitudes with respect to fire safety measures, prompted concerns so great, that the Defence Secretary invited the Dominion Fire Commissioner to carry out fire inspections in Halifax and Esquimalt dockyards. He was then told to submit a detailed report and make appropriate recommendations. Co-incidently, the War Services Fire Protection Committee (WSFPC) was formed around the same time and eventually assumed this task. The WSFPC committee would have a positive impact on all fire related matters in the early war years, shaping future policies for all three arms of the military fire service.

Appointing a naval fire protection expert to head the fire fighting operations took significantly longer for the navy than it did for the army and air force. In 1941, both the army and air force

had decided to employ a specialist as Fire Marshal at each of their respective headquarters. However, it was 1943 before the navy designated a similar position. An explanation for the delayed appointment may be the navy's tendency to follow traditional conventions to extraordinary and often (at least to outsiders) painful lengths. Perhaps it would be less biased to point out that naval doctrine was, and to a large extent is, almost exclusively focused on the realities of operations at sea. A realistic position given the navy's raison d'etre.

The position of Fire Prevention Engineer within the Directorate of Naval Organization, (the equivalent of Fire Marshal) was initially filled by Mr Christian Aldron Thomson from the Office of the Ontario Fire Marshal. He was assigned the rank of Lieutenant-Commander and posted to HMCS Bytown effective 12 May 1943. On 15 September 1944 the position title was changed to Director of Fire Safety.

WAR SERVICES FIRE PROTECTION COMMITTEE

The War Services Fire Protection Committee (WSFPC) although respecting the past recommendations made by various civilian fire prevention authorities wished to place their own stamp on future fire inspections of military installations. (The previous inspections had been carried out under the auspices of the Dominion Fire Commissioner). The WSFPC gradually assumed all authority and responsible for providing technical advice on matters of fire safety throughout the three services. Consolidation of a group of experts to direct and ensure continuity among all three services in matters of fire protection was in effect, a stroke of genius. This initiative eliminated many problems before they could adversely affect operational effectiveness. Eventually the committee would also assume fire protection responsibilities for the Department of Munitions and Supply as it related to companies manufacturing critical war material.

The committee served early wartime Canada exceedingly well, albeit briefly. The WSFPC committee remained active until their last meeting on 6 May 1942 when they were replaced by the Joint Fire Marshal's Committee (JFMC). The formation of the WSFPC had provided a catalyst for the formation of the Joint Services Fire Committee (JSFC). This body would continue to serve the Canadian Forces Fire Service until integration in 1967.

THE ARMY FIRE SERVICE WORLD WAR TWO

The outbreak of war triggered rapid expansion of the Army Fire Service, an enormous undertaking which included the recruiting, training and placement of large numbers of personnel. Huge purchases of mobile and static fire equipment were made, altogether a most significant undertaking.

Developments

The outbreak of war brought many changes to the Military Engineering Branch. Lieutenant Colonel E.J.W. Akins became the Director of Works and Construction, which was a Directorate of Engineering Services. Under the directorate, there were sections for works and buildings, fortifications, design, lands and fire protection. The lands section dealt directly with accommodation and properties, linked directly to fire protection engineering.

Fire protection activities were rapidly expanded during 1941, resulting in the appointment of Major E.J. Desjardin, of the Specially Employed List as assistant Fire Marshal. In 1942, Lieutenant Colonel O.L. Lister, also from the Specially Employed List, became Land Forces Fire Marshal.

Creation of the Army Fire Service doctrine was basically the same as the RCAF concept of operations, as was their induction process. Recruits with municipal fire department experience were designated Camp Fire Chief or Deputy Fire Chief. Others, without experience in fire fighting, were given a brief course organized in 1941, at either Camp Chilliwack or Camp Borden. Graduates were then assigned to a fire department in one of the military installations, there they underwent additional on-job-training. By wars end the army fire service had peaked at 1,500 personnel, distributed throughout the 13 military districts in Canada. This was a force of considerable consequence especially when viewed from its modest beginnings.

Manpower Establishments

The manning of the camp fire brigades was based on the number of soldiers living in the camp. The established scale followed these simple guidelines: 800 to 1,000 personnel required one sergeant and one private firefighter, (supplemented by fire piquet). These personnel would make up the fire brigade strength. A camp population of three to four thousand, would demand one sergeant, one corporal and five privates, until an optimum of one sergeant, two corporal's and ten privates was reached. Included in the equation was a plan that allowed one additional firefighter for every increase in population of a thousand personnel. Finally, twenty-five percent over establishment fudge factor permitted for leave, courses and illness.

Quartermaster Reorganization

Into the army's 1942, the Army Fire Marshal's office mandate was structured the proviso that the fire marshal's office came under RCE. Contrarily his staff remained part of the organizational strength of the Royal Canadian Army Service Corps (RCASC). This was obviously an unworkable arrangement and a Memorandum (HQ 48-1-39 10 Dec 1942) was submitted to allow the fire marshal's office to become, in total, an integral part of the RCE organization. Common sense prevailed and the suggestion met with approval and, for a brief time, the total membership of the Army Fire Service became part of the RCE. Unfortunately, there was another reshuffle in 1942 that involved the Quartermaster Branch and the fire marshal's office again became subordinate to RCASC authority.

Although the Fire Marshal's office was now controlled by the RCASC, fire inspectors assigned from Headquarters to military districts which still worked under the District Engineering Officer. The confusion that resulted from the frequent changes was alleviated to a certain degree by the perseverance of the fire inspection staff. These dedicated few who "soldiered on regardless" in what must have been an administrative nightmare.

In many ways the Army Fire Service was unique. For instance, they had the foresight to build fire vehicles to their own specifications and developing innovations particular to their own distinct operations. They also were able to maintain their own special identity, within the land forces system even through some agonizing organizational upheavals.

Lieutenant-Colonel Lister, the Army's Fire Marshal, announced at a Joint Services Committee meeting that the Army Fire Service was developing a prototype fire truck in their own workshops that would become the standard for all future army fire pumper trucks. This initiative resulted in the production of the G 000-666 standard fire pumper, which remained in use with the army fire service until well into the post war era. At this same meeting he gave notice that he was about to appoint soldiers with previous fire department experience to the camp fire brigades. He concluded his briefing by saying that he fully expected the army fire service to increase to between five hundred and six hundred personnel over the next few months

Limited in size, like many wartime organizations, the Army Fire Marshal's staff was expected to shoulder responsibilities that were extensive and demanding. They included:

a. Fire safety policy for the Army;

b. Providing advice on fire engineering siting, fire protective material, building design and operations therein;

c. Specifications for fire alarms, fire suppression systems and fire apparatus;

d. Standards for the provision of fire protection equipment;

e. Preparation of fire regulations;

f. Boards of inquiries into fire losses; and

g. Preparation of fire loss statistics and periodic reports on fire service matters.

NOTE: A typical list of Fire Marshal duties that would be reflected in any of the three services, inasmuch as the list is an overview and not a fully comprehensive one.

In the short term, until trained firefighters became available, the army placed reliance on fire parties (fire piquet). A system that had little fire fighting capability but was very effective in providing procedures and orders for the rapid evacuation of buildings and preparing well organized personnel muster stations. Apart from the initial first aid fire fighting efforts, the primary fire suppression activities typically fell to the local fire department. The reader can appreciate that given the foregoing, the army fire service at the outset of war was practically non-existent as a stand-alone organization. One might easily get the impression that its past existence was circumstantial rather than one born of necessity.

Training

In 1942 the Army's fire fighting training schools were situated at Camp Borden and Camp Chilliwack. The training schedule of these schools have not been found, consequently little comment can be made on the course content, or demands placed on the students. It must be assumed that the course emphasised the practical side of structural fire fighting and to a lesser extent operational theory. The army fire service had no fire protection commitments for airfields, so crash fire fighting techniques were not taught.

RCAF 1937: FUNDAMENTALS OF CHANGE

The first stirring of fundamental change within the RCAF fire service took place on 26 August 1937 when the Chief Aeronautical Engineer, Group Captain E.W. Stedman, sent a memorandum to the Senior Air Officer (SAO). He advised that his department had found it impossible to keep abreast of developments in fire fighting technology and training.

He made two recommendations, the first, suggested that the RCAF employ a fire fighting expert on a full time basis to direct the total training of air force personnel and to act in an advisory capacity in the design and purchase of fire fighting apparatus. If that failed, his second recommendation was to employ a fire expert in a consultant capacity. In response to the second recommendation, Lieutenant-Colonel L.R. LaFeche Deputy Minister of National Defence, wrote to the Superintendent of Insurances, Mr G.D. Finlayson, requesting a meeting to discuss the fire service situation within the RCAF. Mr Finlayson agreed, with the recommendation that the Dominion Fire Commissioner, Mr Grove Smith should also be a party to the discussions. It turned out to be a landmark meeting as far as the military fire service was concerned; from it would spring the changes necessary to accommodate wartime expansion. To paraphrase a wise old sage, "it was a good idea who's time was long overdue."

Key Appointments

As a result of the deliberations between the Dominion Fire Commissioner's and Mr Finlayson, the Commissioner's office agreed to appoint a suitable fire protection specialist to inspect RCAF installations. The purpose was to study the adequacy of existing fire protection services. The

aftermath of these inspections, recommended the RCAF appoint an individual to take over the administration of the RCAF Fire Service. Based on this recommendation RCAF Headquarters initiated action to recruit a person to oversee the management of its fire protection services. To this end, a circular was prepared, (List No. 771) and issued to advertise for an acceptable candidate through the Civil Service Commission. The circular read "Fire Prevention Engineer, male, Department of National Defence, Ottawa $2,220 per annum. Competition number 29289 for the RCAF Branch of the Department of National Defence" . This was an vital step in the development and later expansion of the military fire service in that it established a recognizable body within the RCAF that was accountable for its continued growth and operational efficiency.

Perhaps worthy of note is the designation of "Male" Fire Prevention Engineer, a statement that today would suffer a storm of recriminations from all sectors of the general public. It is, however, a statement of the times and the attitudes that prevailed, and important when one tries to place history in some kind of perspective.

Fire Protection Officers

In 1939, Mr L.J. Bishop, who was a member of the Ontario Fire Marshal's office, wrote a letter to Air Marshal G.M. Croil volunteering for the advertised position. His credentials were favourably received and he was accepted into the RCAF. Also accepted into the RCAF was a Mr P.S. Snarr who had previously been employed by the Pyrene Manufacturing Company as a fire protection engineer.

Both men were given their assignments and in 1940, Flying Officer Snarr was assigned to Air Force Headquarters, Ottawa, as the Fire Prevention Officer and Flying Officer Bishop was appointed Command Fire Prevention Officer at No 1 Training Command Headquarters located in Toronto. He remained there until January 1943 when he was posted to Eastern Air Command.

Flying Officer Snarr was to assume an important role during these formative years. He attended the initial organizational meeting that resulted in the formation of the War Services Fire Protection Committee on 29 April 1941. He later became the RCAF representative on this committee until November 1941 when, because of deteriorating health, he was replaced by Flying Officer J.E. Ritchie (later Squadron Leader) who had recently left the Ontario Fire Marshal's Office to take up the position.

The unselfish role the Ontario Fire Marshal's Office played by supplying experienced fire officers to spearhead the building of the armed forces fire services cannot be over emphasized. Every skilled person who left their employment to join the military, increased their own work load significantly. Their willingness to serve the forces by generously sharing their manpower resources was truly commendable. All three services, not to mention the country, owes them a large debt of gratitude. In retrospect it is remarkable how little official acknowledgement their efforts have been given. One can only assume that a large portion of the populace was also guilty of unselfish patriotic participation during this time, hence the silence concerning their efforts.

The Commonwealth Air Training Plan

The restructuring of the RCAF left the fire service realigned within the Directorate of Supply Administration and consisted of the following establishment:

Establishment Strength

one Flight Lieutenant one Flying Officer

one-Warrant Officer II one-Warrant Officer II

one-Clerk grade III three-Clerks grade II

two-Clerks grade II ----------

During the First World War, 19,000 Canadians enrolled in the ranks of the Royal Naval Air Service and the Royal Flying Corps and their successor, the Royal Air Force. A significant air training scheme had operated in Canada during these years in which both Canadian and American servicemen became qualified as pilots, navigators and air gunners. However, because Canada had no air force of its own, the Canadian airmen became absorbed into the ranks of the British Air Services. For this reason Canada's contribution toward the struggle for air supremacy during the First World War went largely unheralded. Canada's important role in the training of airmen, was also overlooked. During a speech in 1939, Prime Minister Mackenzie King referring to this topic was adamant: "this was not going to happen again"

At midnight on December 1939, a small group of men gathered in the office of Prime Minister Mackenzie King for the signing of a document that would launch the British Commonwealth Air Training Plan (BCATP).

Its development resulted in a rapid increase in the number of air training schools and, in the fullness of time, would contribute more than 130,000 airmen to the air forces of the allied nations. As the training plan began to take shape, the construction and commission of large numbers of airfields made establishing a fully organized, well trained fire service imperative. There was a feverish bout of activity at this time that reached into every corner of the country, a kind of national single mindedness that only the threat of total war can generate.

To give the reader some perspective of the scope of this undertaking consider the following: between 1939 and 1944, over eight thousand buildings were constructed (seven hundred of which were aircraft hangars); three hundred miles of water mains were laid; and storage facilities for some twenty six-million imperial gallons of aviation fuel. Perhaps one the explanations for the rapid construction of the wartime buildings lies with the superb efficiency of the facility design crew, based in Ottawa. The engineering design for all the wartime construction came

from their offices, they were able to rapidly produce sets of standard building designs for use anywhere in Canada.

The following is a quote by a building contractor for wartime aircraft hangers: "The hangars came prefabricated from large producers of heavy timber. They were all timber; beautiful timbers in those roofs, lots of fir, four by twelve, four by eighteen, even four by twenty. There was a shortage of steel, they needed that for shells, and so the wood structure fitted in admirably with Canada's natural resource production. That's how the trusses were made-just wood and some bolts". A construction helper described it this way: "The hangars came in by rail and then they were trucked out just as you would truck out a load of lumber. They were all shipped precut and all we did was bolt the skeleton together, nail on the siding, and shingle it. The doors were shipped in ready-built. We could put up a hangar in no time".

The final cost of this undertaking calculated by the financial experts was over two billion which when broken down between the participants (Britain, Australia and New Zealand), ended with Canada paying seventy two percent of the total cost. The spectre of losing newly constructed structures and precious fuel supplies through fire, produced the impetus necessary for the unprecedented expansion of the military fire service.

Recruiting

Civilian fire departments initially provided the professional leaders capable of running the newly expanded fire service. Once again the Ontario Fire Marshal would play a key role in recruiting and training for the initial intake of firefighters. The first intakes were given a hastily designed three week course and graduated a total of nine candidates by mid September 1940. Graduates of these courses were all professional firefighters drawn from departments across the country.

Upon graduation they were awarded the rank of Corporal, Sergeant or Flight Sergeant, depending on the experience or rank they had held in civilian departments. They were then posted to one of the many RCAF stations opening up across the country. Although, admittedly some of the professional firefighters - to their chagrin, ended up initially at least, in a few of the back water bases where they languished until they could manoeuvre a transfer to a more active location. The demand for firefighters for overseas service in the auxiliary fire brigades of Great Britain plus the continued requirement for firefighters in the municipalities, culminated in a countrywide shortage of trained firefighters. This particular problem became a point of discussion at the Fire Prevention Officers' Conference April, 1941.(item 4a)

In July 1940, the Ontario Fire Marshal's Office and the Dominion Association of Fire Chief's sponsored a fire fighting course at the University of Toronto. (There would be a total of three). Nine personnel attended the first course that ran for three weeks. Graduates, mainly firefighters from civilian fire departments, were to form the nucleus of supervisors destined to serve in the newly constructed RCAF fire halls.

Training and Manning

The RCAF response to the continuing shortage of trained firefighters, was the opening of its own fire fighting school in Trenton, Ontario. Thereafter, it became common to induct recruits without previous fire fighting experience, for training as firefighters. The frequency of training courses, hinged on the recently developed scale for manning fire halls. The actual number was dictated in large part by the units establishment of mobile fire equipment, compared to today's rationale where manning levels are based on the quantity of infrastructure or designated airfield category. Typically, the early manning would be as follows:

A Fire Tender A Fire Trailer

One NCO One NCO

One Driver One driver

Four airmen Three airmen

This was the recommendation of the Fire Protection Officers meeting held in early 1941. However, a memorandum to the Minister (File: 925-1-72 (DAO) dated June 1941, suggested the following manning:

Fire Tenders

Two NCO's (1 Flight Sergeant and 1 Sergeant

2 Drivers (2 AC's)

7 Airmen (2 Corporals, 5 AC's).

For Fire Trailers

2 NCO's (1 Flight Sergeant and 1 Sergeant

2 Drivers (2 A.C.s)

6 Airmen (2 Corporals and 4 AC's)

The memorandum also included a recommendation that in the future firefighters be given the task of driving the fire vehicle. The existing system employed Motor Transport (MT) drivers and ignored the fact that the driver had to be a practised pump operator. There was also the question of airfield familiarization, constantly changing drivers made realistic team training extremely difficult. These recommendations were accepted and the firefighters took over the driving duties. Nevertheless, the manning strengths (or lack thereof) were to continue as a bone of contention for some time. Many stations adequately manned, others not so fortunate.

In an effort to upgrade the command structure of the fire fighting service, several senior NCO's were commissioned to the rank of Pilot Officer and appointed as Command Fire Prevention Officers (CFPO's). Their task was to develop a schedule of inspections for each installation within their jurisdiction and carry out on-site visitations. Their assessments of equipment suitability and overall department efficiency was then forwarded to Air Force Headquarters. It was the custom to schedule a meeting

It was custom to schedule a meeting of the Station Fire Prevention Committee to coincide with the CFPO's visit. The CFPO would act as technical advisor and offer guidance and advice on local initiatives for fire prevention.

The Air Force Fire Service would eventually obtain a maximum strength of 1,700 trained firefighters. Which was more personnel than the combined total of firefighters employed by the cities of Toronto and Montreal in 1941.

Inauguration of the RCAF's first organized fire fighting school took place at RCAF Station Mountain View, a satellite airfield approximately ten miles from Trenton. Flying Officer W. McCallum a recruit from the Toronto Fire Department, became its first Chief Instructor. With only a small nucleus of instructors, the task of training newly inducted recruits commenced in May 1941 - the actual training took place at RCAF Trenton. Course size would vary but it was not uncommon for a course to have 50 or 60 students.

The training program carried out at RCAF Station Mountain View and RCAF Trenton was considered by many to be a resounding success. Training and graduating a considerable number of firefighters in a relatively short time, the fledgling school was quick to meet the immediate needs of the RCAF. Unfortunately, the school became the victim of short sighted policy makers who considered the problem of firefighter manpower shortages solved and closed the facility.

However, continuous expansion of the RCAF and the demands of the BATCP resulted in the re-opening of the fire school. This time, all training would take place within the physical boundaries of RCAF Station Trenton. The school was to become part of No 2 Composite Training School (KTS), with new courses scheduled every three weeks. Two of the first courses were allotted to civilians with fire fighting background and the remaining courses were made up of recruits without previous fire service experience. Interestingly, many recruits who received training were members of the Royal Air Force (RAF) and on graduation went on to serve at RAF Stations in Canada. RCAF members were normally posted to Stations in Canada, although twenty-five did go overseas.

Twenty-five RCAF firefighters posted overseas were actually sent in error. British authorities had asked for "firemen" however, they were alluding to the type that are ordinarily found working around pressure boilers. AFHQ interpreted the request to mean firefighters and promptly sent twenty-five "firemen" to England. The mistake was of course realized on their

arrival in England, but once there remained in Europe where they eventually joined stations supporting No 6 Bomber Group. Later they served in France and Germany, providing crash protection on airfields, and manning fire vehicles abandoned by a retreating enemy. The firefighters assigned to the European theatre found themselves right in the thick of some really hazardous war-time situations; employed fighting fires in downed bombers, with all the associated risks and hazards from exploding ordinance and fuel.

The fire fighting training was scheduled for three weeks duration, with some emphasis placed on aspects of fire theory and use of portable fire extinguishers. Practice fire fighting evolutions were carried out using the two in-house LaFrance pumpers. These trucks were built on an International chassis with an open cab which was the custom of the time. Although this open cab design proved a little impractical for northern climates, it remained a popular vehicle. Equipped with a rotary gear positive displacement pump that, on a good day was capable of producing 600 gpm of water at 120 psi. Students practised fire operations including drafting and pumping exercises at the seaplane hanger on the Bay of Quinte. Hangers and surrounding buildings became practice sites for ladder drills and accompanying hose evolutions.

Airfield crash tenders were vehicles in great demand with most transported straight from the manufacturers to the flying training stations. As a consequence, instruction on this type of equipment had to wait until the newly graduated students arrived at their parent unit.

In a well-meaning attempt to introduce students to the crash vehicles, they were marched over to the operational side of the airfield where they got a long range look at a crash vehicle, through a fence! They then returned to their classrooms to fully absorb the experience. Until their arrival at their respective flying units that was about as close as the initial intakes of trainees would come to an actual crash truck. Eventually the school did get its own crash trucks much to the relief of the instructors and approval of the students.

THE NAVY'S APPROACH

Manpower Nucleus

By early 1941, naval activities on the West Coast had increased to the point where authorities were openly expressing their concerns over the lack of fire protection for the dockside facilities. These concerns were based largely on fire inspection reports submitted by contracted fire inspection agencies. For their part, senior naval personnel were actively promoting the creation of a dockyard fire brigade, consisting entirely of naval personnel.

In 1941 Naval Headquarters approved the hiring of civilian firefighters to act as fire chiefs at HMC Dockyard Esquimalt and HMC Dockyard Halifax.

Firefighter Recruitment Standards

Mr John Dawson Crowthers, a lieutenant with the City of Victoria Fire Department, was approached and eventually hired as the Dockyard Fire Chief at Esquimalt and later, Mr Edward Beals of the Toronto Fire Department was hired to fill the fire chief's position at Halifax. Crowther was given a small office in a rather humble building that in a previous life had been a private dwelling.

When the time came to hire additional firefighters a policy initially introduced by Naval Headquarters, directed the dockyard fire department at Esquimalt could only hire men of 4F (unfit for military service) status. These men were of course unsuitable to carry out the demanding rigors of fire fighting activity, but were hired anyway. It was a policy that underscored the complete lack of understanding the authorities had concerning the fire fighting profession. In fairness it also illustrated the chronic manpower shortages prevalent in Canada during the war years, with all three services and every sector of private industry vying for available manpower. Of course, as civilians the firefighters could quit their jobs at any time, complicating an already difficult situation. The obvious dangers and inherent problems associated with this situation finally became apparent to Naval Headquarters. In the mean time, the fire department members "soldiered on."

At the outset of 1942, Stoker Gordon Lay RCNVR and Stoker Norman Stewardson RCNVR, both professional firefighters from the Oak Bay fire department were posted to HMCS Givenchy, a HMC Dockyard. Both these men were promptly promoted to leading stokers and assigned to Mr Crowther in the capacity of deputy fire chiefs. One of their first tasks was to divide the 4F civilian recruits into two shifts which operated on the standard 24 hours on 24 hours off schedule. They were also tasked to provide an intense training program using the extremely limited equipment available to them.

The mobile fire apparatus consisted of two, two wheeled wooden carts and a couple of hose reels. One wooden cart carried a 45 foot wooden two section pole ladder, one 24 foot wooden extension ladder and one 8 foot roof ladder. The other cart carried a miscellaneous assortment of fire equipment which included nozzles, axes, wrenches, reducers etc. On receipt of a fire alarm these 'mobile' pieces had to be towed/pushed by the crew to the fire scene. To enable the fire crews to effectively fight ship fires or fires involving jetties, there were two 250 gpm two wheeled trailer pumps, housed inside sheds in the area of the jetties. Due to the hilly terrain surrounding the dockyard, they each required at least four men to manoeuvre them around the immediate area.

Conditions of Employment

The duty fire crews quarters at the Esqumalt Dockyard were located on the site of an old residential district that included a few small stores. These buildings had been expropriated to allow for the anticipated dockyard expansion and covered an area of some four to five city blocks. The buildings were demolished with the exception of two small one story bungalows. One was used for fire officer accommodation, stores and a training room, the other for crews quarters and an eating area. These very old structures were built over a three foot crawl space,

that was very dirty and contained years of accumulated garbage. Many hours of hose practice were spent by the duty crew trying to flush out the unwelcome residents who lived there, huge rats! The rodents had apparently taken a liking to living in close proximity to the resident firefighters. (Lieutenant Commander G. Lay personal recollections).

With poor living quarters, makeshift equipment and physically limited crew members it became a very trying time for the three professional fire officers. In fact things could not have been much worse, particularly when contemplating the possible outcome of a serious fire. Notwithstanding all the negatives of the situation, the 4F crews deserved full credit for their obvious enthusiasm and willingness to succeed at a job they were not one hundred percent physically able to perform.

Employment Reassessed

By 1943 Naval Headquarters finally recognized the fact that an effective well organized fire service required personnel that were one hundred percent able-bodied and equipped with modern fire fighting equipment. The results of this change in outlook was truly momentous, albeit long over due. A Directorate of Fire Safety was established at Naval Headquarters headed by Acting Commander C.A. Thomson RCNVR. The two senior professional firefighters on the East and West coasts were accepted into the RCNVR with the rank of lieutenant and appointed to the positions as Command and Base Fire Chief. One would head Pacific Command the other Atlantic Command.

The personnel designated 4F were released and replaced by RCNVR enlisted men. Many of these men came from professional fire departments located in towns and cities across Canada and Newfoundland. The newly appointed RCNVR firefighters were given a special designation FF. The FF designator meant that the serviceman so designated could only be posted (or drafted in naval terminology), from one position to another by authority of the Director of Fire Safety. The FF designator effectively prevented the individual from being shanghaied by another branch of the navy.

Expansion and Training

During this time (1943) the navy, like the other three services, was experiencing rapid expansion; new bases and other facilities were opened and their fire departments staffed by Naval Fire Service personnel. At the same time, the departments were taking delivery of new structural fire apparatus courtesy of LaFrance and Seagrave manufacturing companies. The naval fire service was inescapably coming of age with all bases and facilities now protected by trained firefighters, housed in well equipped fire stations. Supervisors for the most part were professional firefighters thus the level of dockyard fire protection, had improved substantially.

With the unprecedented expansion of the RCN during the Second World War, came numerous vessels that had to be manned. The requirement to place these ships on active duty as quickly as possible, meant that the crews were often required to finish their training while at sea on operational missions. This state of affairs caused a great deal of concern, especially with respect to fire at sea, it was a concern that was not fully addressed until 1944.

By 1944, the US Navy had established what they termed Class 1 Damage Control Schools. The purpose of these schools was to train naval personnel how to cope with shipboard damage caused by fire. The training covered damage by fire, explosion, ramming by another ship (friend or foe) shell fire, torpedoing, in effect the whole gambit of disaster at sea. The emphasis was placed on doing the actual task rather than endless lectures-soon forgotten. Chief Petty Officer Lay (FF), attended one of the US school damage control schools that had been established at the naval dockyard in Bremerton, Washington. On his return to Esquimalt he organized the first RCN fire school established to give short fire fighting training courses to ships crews. Initially the school was extremely rudimentary and accommodated a long narrow gravelled spit of land with the sea in close proximity on either side. The fire school itself consisted of a wooden shed containing a trailer mounted 250 gpm gasoline driven pump. Nearby, was a four foot high circular metal tank about 18 feet across, for training purposes it was half filled with water and topped off with a couple of inches of diesel oil. When the diesel oil was lit the personnel in training were led to the fire equipped with a 22 inch hose, and a Griswald fog nozzle, standard ships fire fighting equipment. Each trainee crew member had to fight the fire first with the wind at their backs, after the tank was re-lit, they would repeat the procedure only this time advancing into the wind. Included in the training were brief instruction on the Rockford foam nozzle and CO_2 fire extinguishers. The training was primitive but it served the purpose. At least the seamen were exposed to a realistic type of situation they might encounter at sea. The main thrust of the exercise was to prove to the trainees that properly applied, the equipment they would find on board the ships was indeed effective.

Personnel serving on the east coast attended a similar US Navy damage control school located in Philadelphia for their initial instruction. More fortunate than their west coast colleagues, they were able to obtain the use of old ships to carry out what must have been far more realistic training.

After the war the RCN opened permanent well equipped damage control schools, located on the east and west coasts similar to their US counterparts. The training structures included large steel tanks and sections of ships or steel structures made to resemble ships. When they initially opened they were both headed by a naval officer from the navy's fire service. Unfortunately, post war attrition resulted in their positions being eliminated. Nevertheless, the training continues today, somewhat refined but basically following the original framework of training.

Naval Fire Service Personnel Changes

By 1946, all RCN Volunteer Reserve personnel had been demobilized. A decision had been made to change the naval dockside fire service into an all civilian organization. Within a short

period of time many changes took place at the higher levels of the fire service. Acting Commander C.A. Thomson had left, later to become Dominion Fire Commissioner. Taking his place as Director of Fire Safety was Acting Commander E. Bevis. (In a brief time he would also return to civilian life). Lieutenant Commander Basil Nixon also left the naval fire service to become the Fire Marshal for British Columbia. With Lieutenant Carson leaving to take the post as Fire Marshal for Saskatchewan the naval fire service was losing its finest officers, as witnessed by the prestigious positions they occupied outside the navy.

This exodus of top level people opened up positions as Director of Fire Safety in Ottawa and Command Fire Marshal Atlantic. Two officers returning from their tour in Europe as part of the Canadian Corps of Firefighters were selected to fill these vacancies. The Directors position was filled by W. Simpson who was commissioned with the rank of Lieutenant Commander. Lieutenant Commander Simpson had been a member of the Toronto Fire Department prior to joining the Corps of Canadian firefighters. It was during this time of change that the decision was made to the Command Fire Marshal Atlantic and Pacific responsibilities to include that of Base Fire Chief in both Esquimalt and Halifax. Thus the title became "Command and Area Fire Chief." On the East Coast the position was filled by Mr Joseph Harber, as a civilian. Prior to service overseas with the Canadian Corp of Firefighters, he was the Acting Fire Chief of the City of Halifax. On the West Coast the former wartime Command Fire Marshal John Crowther became Command and Area Fire Chief. Warrant Officers Lay and Stewardson were both demobilized and took up positions as deputy fire chiefs under Chief Crowther.

In 1947, the naval fire service appeared well settled on its post war course. Regardless, there was further changes afoot. Lieutenant Commander W.J. Simpkin the Director of the naval fire service had been hard at work trying to convince National Naval Headquarters to make all senior positions in the fire service, naval officers. He finally achieved his objective in 1950. By April 1951 both Command Area Fire Chief positions were redesignated to RCN Lieutenant Commanders. Their title once again became Command Fire Marshal only. On the West Coast Deputy Fire Chief Lay was appointed Fire Chief with the rank of Lieutenant (SB) RCN. On the East Coast newly inducted Lieutenant (SB) Harry Curran RCN was appointed Base Fire Chief Halifax.

The move to re-establish RCN officers within the naval fire service was no doubt well intentioned, nevertheless, it caused enormous upheaval within the service. In effect, the senior officers had gone from civilian to naval to civilian and now back to again to naval status. In addition to enlisting all the top civilians into the navy it was apparent that four more junior officer positions would have to be staffed. These junior officer positions were ear marked to be filled by the personnel presently occupying fire captain positions. Unfortunately, these senior captains all were outside the stringently enforced RCN age limitations for inducting officers.

The failure to recruit the senior fire captains as officers in the RCN was addressed by searching at the lower rank levels of firefighters to seek personnel who could qualify to become officers. The result was the junior members became officers and returned as fire chiefs, supervising the

more senior and experienced fire captains. This situation often caused friction between senior members of the respective fire departments.

Naturally, at this time, there was no thought of integration of the three services which would have possibly redirected the thrust of these changes. In retrospect the changes made by Lieutenant Commander Simpkin were not well received and became divisive and the desired goal fell somewhat short of expectations. In effect there was a rank structure imposed on the naval fire service that was unwieldy as it was in some respects unfair. Had the fire service remained totally civilian natural progression to senior levels would have taken place much as they did in municipal fire departments. (Lieutenant Commander G. Lay personal recollections)

RCN Fire Stations 1939 to 1946

In 1939 the RCN had, outside of National Defence Headquarters, only two major areas of operations. These were HMC Dockyard and HMCS Stadacona in the Halifax area, and HMC Dockyard and HMCS Naden in the Esquimalt area. The dockyards performed maintenance, repair and supply services while HMCS Stadacona and HMCS Naden served as training, administration and manning pools in support of the fleet. As the war progressed many other strategic installations opened to better serve the expanding fleet. NDHQ deemed it desirable to have naval fire departments protect these facilities, as a result naval fire service departments were established at each of the following naval installations:

WEST COAST

HMC Dockyard Esquimalt BC

HMCS Naden BC

Prince Rupert Base-Prince Rupert, BC

EAST COAST

HMC Dockyard, Halifax NS

HMCS Stadacona NS

HMCS Cornwallis NS

HMCS Avalon St. Johns, NF

HMC Dockyard St. Johns, NF

Naval Ammunition Depot,Dartmouth, NS

RCN Ammunition Depot Bedford, NS

Naval Ship Repair Base -Shelburne, NS

Naval Ship Repair Base -Point Edward NS

Naval Armament Depot St. Johns, NF

Two RCN Hospitals at St. Johns NF

QUEBEC

Signals and Training St. Hyacinthe,Que

The listed installations give the reader some kind of idea of the enormous expansion of the naval facilities and of course the corresponding expansion of the fire service to protect them. The expansion from a nucleus of 4F civilians in 1942 to the naval fire service status in 1944 was nothing short of extraordinary. The RCN was indeed fortunate to have been able to recruit heavily from the ranks of the civilian departments in towns and cities across the country.

Post War Activities

Following VE Day, demobilization of the RCN Reserve swung into high gear, along with the closure of naval installations. Some of the first installations to close were: Prince Rupert, Ship Repair Depot Shelburne, Signal School St. Hyacinthe, Que and all the installations in Newfoundland with the exception of the HMC Dockyard.

In order to continue to provide fire services to the remaining installations NDHQ received approval to maintain a naval fire service staffed with civilians. Many who entered the civilian service were ex-RCNVR firefighters which made the transition relatively smooth. Although quite a few chose to return to their original departments and take advantage of their seniority and accumulated pension plans.

Fort Pepperell: Newfoundland

Fort Pepperell was a huge wood constructed installation that was declared surplus by the USAF in 1960, and subsequently turned over to the RCN for care and maintenance. This action coincided with the closure of the DND wharfside facilities in St. John harbour. The fire boat also being declared surplus at the same time allowed naval personnel to relocate in the now vacant Fort Pepperell. However, the tide of attrition soon caught up and the property was turned over to the Government of Newfoundland. Naturally, the fire service presence there was terminated. It was understood that part of the transfer arrangements included relocation of civilian personnel and their equipment into the St. Johns Fire Department. Unfortunately, the situation developed into something of a dispute mainly because it raised questions over pension transfer, pay differentials and seniority. The precise ending to this story is not known, it is assumed that when the dust settled an amicable solution was found. It is related here to illustrate the kind of

employment conditions that ex-servicemen sometime faced at wars end, it was not all sweetness and light.

Debert Army Camp and Airfield

The RCN took over what remained of the wartime hangars and buildings located at Camp Debert in 1962. The hangars were used to establish a storage and distribution depot for all RCN medical stores. The army had established a small civilian fire department on the site. This operation was taken over lock, stock and personnel by the Naval Fire Service.

It was not considered practical for tracker aircraft pilots to practice "touch and go" simulated carrier landings at Shearwater, it was decided to carry this training out at Debert. Whenever these practices were scheduled for the Debert airfield, a Walters crash truck would be driven down from Shearwater with a civilian naval crew to perform stand-by duties. Many hours of overtime had to be paid out as the navy demanded that the four man duty crew be supplemented by off duty firefighters. Actually, the individual firefighter was not completely inconsolable over this aspect of the job. Around this time an underground communications facilities (Diefenbunker) was constructed at Debert, these 'bunkers' built at various locations across Canada primary use was to house local government officials if a nuclear war to break out. They also incorporated a communications role. Naturally, fire protection services for this installation also fell to the on-site fire department.

The use of the airfield by the RCN ceased after the aircraft carrier HMCS Bonaventure was decommissioned.

Naval Fire Service Waterborne Units

During World War II the National Harbour Board maintained and staffed a boat in Halifax harbour to protect shipping and dockside properties. It was an important role, the sheer numbers of ships gathered in Halifax ready to cross the Atlantic in convoys and the vital war material stored at dockside made the presence of the fire boat an indispensable part of the operation. In pre-war years the reliance for fire protection was placed on shore based fire fighting capability, which were equipped to draft large quantities of sea water to combat fires in and around the dockside area.

Shortly after the attack on Pearl Harbour, all Japanese fishing boats on the West Coast were seized and their crews transported to interment camps. One fairly new vessel that was impounded was an ocean going 70 foot fish packer with a bridge mounted fire fighting deck monitor. This vessel became part of the RCN Fishermen's Reserve, operating out of Esquimalt harbour, she was never used in a fire fighting capacity. Her designator was HMCS Universe.

As with the East Coast the West Coast was experiencing an enormous increase in ships and harbour facilities, this and the ever pressing threat of a Japanese attack made the need for waterborne fire fighting capability essential. Before 1943 most of the dockside fire fighting

capacity was provided by drafting water with the LaFrance pumpers, the limitations placed on this operation through low tide water levels forced the authorities to search for alternate methods. In 1943, a large wooden barge with an immense deckhouse was obtained, the oversized deckhouse was used to cover the two 1,000 gpm centrifugal fire pumps, driven by a V12 gasoline engine. Protection was afforded the deckhouse when it was engaged in fire fighting operations by a water curtain. There were two upper mounted monitors and eight 22 inch hose outlets on the deck. Although it stayed in service until the early 1950's, it had two serous defects. First, it had to be towed by a tug to the area of operation. Second, unless it could be secured to a dock, jetty or other fixed object when the monitors were in operation, it was almost impossible to keep it from drifting off station because of the enormous backpressure exerted on the barge by the monitors discharge.

At wars end the RCN had an outstanding contract with an Ontario shipyard to build three harbour tugs; vessels the navy no longer required. This was somewhat fortuitous for the fire departments, for the three steel hulled ships were modified with fire pumps and deck monitors and fire hose connections to make excellent fire boats. On completion, the dock yards at Esquimalt, Halifax and St. Johns each received one of these vessels. Later, 22 inch and 12 inch hose reels and fire equipment lockers were installed. These ships gave much needed service to the RCN and civil authorities during their tour of operation. The Esquimalt based boat was dispatched on two occasions to the City of Victoria's waterfront to combat fires that had progressed beyond the control of the city's shore based apparatus. Similarly, the Halifax fire boat fought many fires in the harbour area. So important was the fire boat to the City of Halifax that it paid DND, 40,000 per year to secure its services. After the removal of the more dangerous wooden piers and most of the highly combustible buildings had been completed the payments ceased.

As previously mentioned the naval fire boat in St. Johns harbour was disposed of in 1962, the vessels at Esquimalt and Halifax were replaced in 1975 with two fire boats built in Vancouver. Lieutenant Commander Lay was given the responsibility of consolidating all the fire fighting requirements on the two vessels. These new boats incorporated "state-of the-art" fire fighting capability, with a 5,000 gpm pumping capacity, delivered through three deck mounted monitors, or 12-22 inch hose connections mounted on the vessels deck house.

Termination of the Naval Fire Service

On 17 March 1966, a lettergram was received from Canadian Forces Headquarters, addressed to all Commands and the 5 RCEO's signed by Air Marshal C.L. Annis which directed that all Command fire responsibilities, other than special weapons, would be assumed by RCEO'S.

On 1 April 1966, Colonel E.A. Ballantyne Regional Engineer 1 RCEO, put into effect the order outlined in the lettergram of 17 March. With its implementation three service fire organizations died and the 1 RCEO fire marshal assumed the responsibilities for all military establishments in the four Atlantic Provinces.

Although the Royal Canadian Naval Fire Service no longer exists in name there is no question its personnel worked hard to build a first rate fire service. They deserve a lot of credit in bringing the naval fire service from an ill equipped poorly manned, chaotic, ill prepared organization to a service of well trained superbly equipped division of the navy.

The Naval Fire Service was involved in several significant incidents, the most serious occurred in July 1946, and involved the explosion at the Bedford Magazines. During this incident Acting Leading Stoker (FF) RCNVR Gordon Morrison was awarded the British Empire Medal for outstanding bravery. William Carson Lieutenant(SB) RCNVR, Command and Base Fire Chief Atlantic Command was also awarded the British Empire Medal. Harold Coxon Commissioned Technical Officer (SB) Assistant Naval Fire Chief Halifax received a Commendation for his actions.

It began when the USS Volunteer, a freighter which was loaded with phosphates and magnesium caught fire while waiting for a convoy escort. The naval fire service from HMC Dockyard Halifax was called to render on-board fire fighting assistance. Stoker Carson entered a hatch to attack the fire, an explosion took place while he was engaged in this operation and blew him completely out of the hatch into the harbour. He somehow survived this experience well enough to return to his former job on the Toronto Fire Department. The details surrounding the other awards are not available at the time of this writing. (memoirs Lieutenant Commander G. Lay former Command Fire Chief Atlantic Command).

THE CANADIAN CORPS OF FIREFIGHTERS

Although not strictly military, Canadian civilian firefighters who went overseas can claim a close affinity with the Armed Forces and are worthy of mention. The strongest personal thread of the relationship is that of the Commanding Officer of the Corps, G.E. Huff MM. He had previously been a Flight Lieutenant Fire Prevention Officer in the RCAF, at No 2 Training Command. After several appeals he had obtained his release from the RCAF (not an easy task in wartime) in order to take Command of the Corps. Four hundred of these firefighters volunteered their services to help the people of Great Britain meet and overcome the menace of Nazi air attacks.

The Prime Minister Orders the Corps Formation

Following a visit to the UK in 1941 by the Canadian Prime Minster at the request of the British Government, Canada agreed to form and maintain a Corps of Canadian Firefighters to serve in the United Kingdom. For the purposes of administration, it was placed under the direction of the Minister of National War Services. Recruiting began in March 1942, and within a few months it had achieved a total strength of 422 members drawn from 107 municipalities, and represented all the provinces of the Dominion, of these 406 had been sent overseas by December 1941. Five members remained at the Corps Headquarters in Ottawa, for administration purposes, later two of the five also left for Britain.

Arrival in the UK

Upon arrival in the United Kingdom the volunteers were given a four-week course of fire fighting, rescue work and drill. On completion, they were posted to six fire stations, located in Southampton, Portsmouth, Plymouth, Bristol and London.

Canadian units attended all fires in localities in which they were stationed, many of these fires were caused by German bomber attacks which added great risk to the responding crews. During bomber raids on London in February 1943, the headquarters unit itself came into action both in fire fighting and rescue operations. Its performance was highly commended. While many members of the Corps were injured in the course of their duties, on the whole there were relatively few casualties which may have been due to good luck in some cases.

For instance, on one occasion a Canadian fire fighting detachment was out fighting fires in the surrounding area when a bomb landed on their accommodations destroying them. During the period of the Corps deployment, a total of three members lost their lives several sustained serious injuries. In April 1944, the Corps were given the opportunity to send a company of volunteers to augment the army fire service during the Normandy invasion and ensuing operations on the continent. A special service company comprising of three officers and 98 other ranks was formed and given special training. Later authorities decided not to use the whole contingent, which was a big disappointment for the volunteers.

Recognition of Service

In recognition of service, authorization for the issue of two classes of discharge badge was given by Order in Council. The first, for those who volunteered and served overseas, and the second for those who volunteered and served in Canada for at least six months but did not proceed overseas. The design for both classes of badge consisted of a silver button in the centre of which appeared an impeller in red enamel, the official insignia of the National Fire Service in the UK. The badge is encircled with the words Canadian Firefighters, 1942-45, and the whole surmounted by a crown. Service overseas was indicated by the addition of a scroll underneath the badge with the word Overseas.(ref)

Awards Received

Some awards the Corps received for service included:

OBE Commanding Officer G.E. Huff

MBE Senior Company Officer N. Torno

BEM Senior Company Officer M.W. Dolman

BEM Leading Fireman C.J. Diwell

BEM Section-Leader J.J. Dewaal

In addition, C.J. Diwell was awarded the Royal Humane Society Testimonial on Parchment for promptitude in saving a life from drowning. Leading firemen I.F. Cam and W. Bryce were awarded the Royal Society Testimonial on Vellum for saving a life other than in the course of duty.

Following the departure of the Corps, Sir Aylmer Firebrace, Chief of Staff of the National Fire Service paid the following tribute:

> "May I say what a pleasure it was to have the Corps of Canadian Firefighters with us. Efficient firemen of fine type and first class physique they have made a thoroughly good impression over here." (History of the Corps of Canadian firefighters pp 48 Supplied by the National Archives).

Footnote: "On recognition of the Minister of National Defence, concurred by the Acting Minister of Veteran Affairs, Order in Council P.C. 4210 of August 27, 1940, authorized the Memorial Cross for issue to mothers or widows of personnel of the Armed Forces and Merchant Navy was amended by Order in Council P.C.5263 of December 23, 1946, to include the mothers or widows of members of the Corps of Canadian Firefighters whose death occurred either during their service or subsequent to such service but attributable thereto."

THE WAR YEARS 1938-1945

The Second World War heralded a time of unprecedented expansion for all three services. The Canadian military rapidly progressed from mediocre strength to a force of considerable size and power. The fire services were also benefactors of the expansion, obtaining increases in manpower, vehicles and equipment. Justification for the rapid expansion came from the frequent aircraft crashes and large fires that occurred during the war. Several of these large fires threatened vital war material stocks. These incidents all served to underscore the fire services potential value. The fire service was able to demonstrate its value by limiting the amount of destruction caused by fire.

Serious fire losses in the early years reinforced the importance of fire protection especially at places such as RCAF Mossbank, Saskatchewan where the destruction of major buildings occurred. Another equally destructive fire occurred in May 1941 at the air observer school at Portage-la-Prairie. One week after a hangar had been constructed and a dozen new aircraft had been placed inside, a student pilot flying in high winds suddenly stalled and crashed into the roof. As luck would have it, the dozen or so twin engine Anson aircraft parked inside the building had just been refuelled. In moments the aircraft gas tanks were exploding, making the hangar unapproachable for meaningful fire fighting operations. Prevailing winds managed to spread the fire to a nearby hangar, but through the extraordinary fire fighting efforts of the on-

site firemen, firefighters from a nearby RCAF Station MacDonald and the City of Portage. Hangar No I and other adjacent buildings were spared, unfortunately, hangar No 2, where the original fire started was gutted. With duely applied wartime hase, the destroyed hanger took just three months to rebuild.

Construction of swimming pools to provide an adequate water storage for fire fighting needs was among the remedial actions taken after devastating fires at Mossbank and Dafore bombing and gunnery schools. These were the only schools on the Prairies to obtain swimming pools for supplementing fire fighting water supplies. A more cynical person may have been more inclined to suspect an ulterior motive! Similar situations were prevalent across the country where a number of highly destructive fires added credibility to the continued growth of the military fire service.

The Canadian public were also beginning to appreciate the importance of a well equipped, well-trained military fire service. This attitude may have stemmed in part from stories of the London Blitz that were very much in the news. In 1942, the Yorkton Enterprise reported, "Fire protection was of considerable importance, particularly during wartime when economy must be the watchword, it is sound logic to invest money in good fire-fighting equipment than suffer the huge losses that are often the result of fire." This quote hits the nail squarely on the head and mirrors popular wartime fire protection attitudes.

The Northwest Staging Route (NWSR)

In 1942 as a result of the United States concern for the Japanese threat, the Canadian and US Permanent Joint Board of Defence recommended that an air route from Edmonton to Fairbanks, Alaska be built. The proposed route was one that had already been tentatively decided upon by the Canadian Government to counter the Japanese invasion threat. The North West Staging Route was composed of a series of airfields with intermediate landing fields that constituted an aerial highway that would provide a means of rapid deployment for troops and supplies. In due course, firefighters were called upon to man these northern outposts. NWSR in effect, would be an aerial version of the Alaskan Highway-without the potholes!

By October 1942 firefighters were already moving into their new NWSR fire halls to support this venture, complete with standard issue pumper and crash truck. Training station personnel and the scaling of the various buildings took up a considerable amount of their time. Then, as now, the more remote the installation, the more self-reliant the fire department had to be. Living and operating conditions were extremely harsh on these northern airfields, with firefighters hard pressed to keep their vehicles operating in the extremely cold winter months. As air operations increased, so did the requirement for firefighters and a steady flow of replacements headed north. Understandably, additional firefighters were always well received by personnel already on site.

Works and Buildings

The RCAF began to restructure its supply organization, in 1942 fire protection moved from supply section control to become part of the Works and Buildings (Construction Engineering) Division. The fire department has basically remained within this organizational framework ever since. Titled Works Fire Protection Officer, the Chief Fire Marshal reported to the Director of Works and Buildings.

Manning Levels

Manning levels of each department varied, depending on the responsibilities and operational activities of a particular installation. For example, airfields dedicated to flying training had a flight sergeant appointed as the NCO i/c of the fire hall (Fire Chief), with a sergeant Deputy and between 16 and 18 crewmen. The manpower was divided into two shifts, each working 24 hours, on 24 hours off. When there was room, all firefighters were expected to live in the fire hall. The rationale for this was simple, if a firefighter happened to be in the fire hall when an alarm sounded regardless of status he was automatically presumed to be On Duty. During emergencies extra crew members were welcome additions.

Fire Halls

The design given to most wartime fire halls was an off-the-shelf standard issue that was the basic pattern for every fire hall in the RCAF with minor modifications. This was an austere practical solution that saved time and money on construction (a wartime maxim). War-time fire halls' embodied a two-bay vehicle garage, an office where the coded alarm panel was located, a hose drying room, a dormitory shower/washroom and a recreation area. The fire hall structures of this time, although somewhat austere by today's standards, were quite functional. The cost to build one of these halls came in at $10,500.00, a bargain all things considered. With suitable pause for reflection, one has to wonder at the large numbers of buildings, pavement, and infrastructure in general that was being constructed at this time. Where did the finances come from and the work force needed to construct them? Considering the armed forces, munitions factories and a multitude of other vital industries were accounting for a large percentage of the Canadian population. The question has always been a fascinating one-just where did all the people come from?

The daily routine for the airfield crash crew would consist of standing by for flying operations, by pre-positioning their crash truck at the foot of the control tower or other position of advantage. When assigned to duty in the fire hall, the crew would typically work on maintaining fire extinguishers, equipment repairs, painting, fire inspections and/or training evolutions. They would normally be expected to handle most structural fires independent of the crash crew, if flying operations were still in progress. This type of activity has been the lot of the firefighter since the very first organized fire brigade stood watch, although todays military fire departments spend significantly more time on fire prevention, education, and reviewing fire engineering projects.

Equipment and Procurement

The rapid expansion of the armed forces coupled with the pre-war neglect, had left the fire service virtually bankrupt with respect to portable and mobile fire equipment. A procurement program was initiated to remedy the situation. The program was impressive in scope, the RCAF alone purchased over 100 Code 33 structural pumpers and 250 crash trucks. In addition, several hundred hose reel carts and literally thousands of fire extinguishers were also procured. Two types of hose were acquired, the 22 and 12 inch rubber lined, double jacket, cotton covered hose, excellent hose that would serve the fire service satisfactorily for many years. The 12-inch hose was delivered with a standard pipe threaded couplings. Unfortunately, the 22-inch was delivered with some 27 different thread specifications. The idea was well intentioned, as the variety of threads was an effort to be compatible with any local municipal specifications. Unlucky, like so many good intentions it fell short of its aim when it came to practical application. It also caused a fair amount of havoc within the supply system. Today, Canada is still without a common fire hose specification, although the number of different thread specifications across the country has been substantially reduced. The military for its part converted to Stortz couplings in the mid-1980's a type of coupling long used in Europe. A coupling that can be readily connected from either end, it has eliminated the complications associated with male-female coupling arrangement and is quicker to connect. Somewhat ironically, the only departments that were compatible were European, the Stortz couplings are incompatible with almost all Canadian Municipal fire departments. Consequently the military departments with a mutual aid requirement still have to carry adaptors.

Comprehending the almost indecent haste to rid military departments of perfectly good hose couplings in order to purchase the Stortz type, still mystifies those of us who saw little or no immediate problem with the conventional screw type coupling. Budgetary considerations notwithstanding. NOTE: In the early 50's the Ontario Fire Marshal's Office organized and carried out a fire hose thread specification standardization program. Effectively reducing the twenty seven different thread specifications to ten or twelve.

Protective Equipment

Protective clothing and breathing apparatus purchases were made by AFHQ under the guidance of the Fire Marshal. There were two general types of breathing apparatus available to the service firefighter, the all service filter type and the re-breather style (Chemox) used by mine rescue and shipboard damage control teams. The limitations of a filter type breathing apparatus were well known to the informed firefighter, nevertheless, wearing them tended to give many an undeserved sense of security. These questionable pieces of life safety equipment were not abandoned until some years later when their limitations became subject to strong criticism.

Asbestos fire blankets were very much in vogue, with every fire vehicle carrying at least one and fuel points and mess halls similarly equipped.

As a result of the rapid expansion of the armed forces and the depleted state of their pre-war fire equipment inventories fire equipment manufactures did a booming business.

Crash and Structural Fire Protection

Every RCAF flying station had at least one structural pumper and one crash tender. Some of the larger airfields had a satellite landing field if so, they were supplied with an additional crash tender. This vehicle would be dispatched to the satellite site when flying was in progress. Normal deployment would have the pumper on stand-by in the fire hall and the crash truck positioned at the base of the control tower, during flying operations. Hanger line personnel often provided the crew for the extra vehicle, chiefly because of their knowledge of the particular aircraft. Their assistance often proved invaluable. The catch phrase for the firefighters who spent their days in front of the control tower was monotony, with only the activity of routine flying operations to watch or response to an occasional incident it was truly a

trying task.

Having spent many hours (post war) performing a similar duty the word monotonous (who's etymology is derived from the "Greek" meaning "I might as well have joined the Military Police") doesn't quite do justice to the experience. Although it must be confessed that a firefighter's aircraft identification skills certainly improved. Strange aircraft in the circuit created instant interest. The historian (Churchill?) who coined the phrase "those who wait, also serve" must have spent time on stand-by duty!

Code 30 Pumper

The Code 30 pumper came equipped with an open cab, mounted on an International Chassis. It had a class "B" rotary gear positive displacement pump, rated at 600 Gallons Per Minute (gpm) at 120 psi. This vehicle was later to become more widely known as the G10 pumper. Its equipment included a 24-foot extension ladder, 1200 feet of 22 inch hose and 300 feet of 12 inch interior attack hose. It also carried ancillary equipment such as axes, wrenches, pry bars and extinguishers.

Crash Vehicle Development

From the beginning of flying operations the need for a crash response vehicle with an efficient off-road capability became apparent. Pilots did not necessarily choose a firm, easily accessible crash/landing site. More often than not they would end up in a field whose surface was often hostile to the passing of heavily laden motorized vehicles. The first attempt at manufacturing an off-road vehicle began in 1937 by specialists at Camp Borden who were determined to resolve this dilemma. To this end they assembled a half track crash tender, on a Ford chassis complete with a fire fighting package. It was a good idea, but, for a number of reasons, this project was abandoned before it became a workable production model. Lack of speed and R&D funds were among its main enemies. It would appear that every attempt to produce a first-rate all terrain vehicle fell victim to the unalterable fact that fire extinguishing agents are extremely heavy and

would either sink or slow the machines when they tried to leave firm going. Nevertheless, it was an imaginative effort and would fair no worse than many later attempts to manufacture a similar off-road vehicle. As the immortal bard once said "those who do not learn from history are forced to repeat it", and repeat it they did! The experiment did have something of a positive spin-off, however,the chassis provided the foundation for the venerable Code 33 Crash Tender.

Built on a Ford chassis that used a Marmon Harrington drive train, the crash vehicle of choice during the war years was the Code 33. It was equipped with a rotary gear pump capable of producing 350 gpm of water at 150 psi via two 12 inch ports each controlled by a quarter turn valves located at the rear of the vehicle. Air aspirating playpipes attached to two 100 foot hose lines gave the truck a foam producing capability. Powered by an 85 horsepower engine, the 1941 model attained a respectable speed of 50 plus miles per hour. Incorporating a manual transmission, with high/low range and four-wheel drive (the front wheel drive could be disengaged when travelling on firm terrain). Experienced drivers were able to maximize the transmissions hi-lo versatility and thereby attained top speed quickly. Ability to achieve maximum speed fast became a point of personal and professional pride and much was made of an individual drivers dexterity (the less skilled invariably ground the gears usually to vocal scorn of the rest of the crew). Another interesting feature of this vehicle was the routing of the exhaust system through a box that contained the under truck piping. The theory advanced, was the heat given off by exiting exhaust gas would prevent the water lines from freezing. The question that springs to mind is, did the system work? Logically it makes sense to use the engines expended energy to enhance economy and efficiency. Further pursuit of the concept was not undertaken therefore, we would have to assume that it was not a viable method of preventing water line freeze-up ..... or was it?

The nature of the crash fire vehicle's role meant that increased speed became an all consuming goal. In 1942, trials were conducted using an upgraded 95 horsepower engine that proved successful and overall vehicle speed was boosted to more than 60 miles per hour. Later, the 95 horsepower engine would became the standard for all trucks produced in 1942. Ancillary equipment included a 100 lb Carbon Dioxide (CO_2) extinguishing system. It came complete with two 100 ft reels of one inch high pressure discharge hose, mounted on either side of the vehicle between the cab and the body. After the war, these vehicles for some inexplicable reason became identified as the G15, crash tender.

Any impression that there were crash vehicles available on demand was false, as some units waited a considerable time before taking delivery. The following is typical of the times opening deficiency report No 10 Air Observer School, in Chatham (AFHQ File 926-15-1 dated 21/5/41) directed that Motor Transport (MT) vehicles be furnished with fire equipment to serve as a crash tender until one is made available signed Flight-Lieutenant P.S. Snarr, Fire Prevention Officer Air Force Headquarters. Typically, this situation would have been repeated in many other locations until vehicle production caught up with demand.

Water Fog

In the fall of 1941, the Fog Nozzle Company of Canada Limited introduced an idea that enhanced the application of fire fighting water by the generation of a fine water spray (Water Fog). Trials were conducted at RCAF Station Uplands and proved conclusively that low pressure water fog attached to a suitable applicator could be used effectively in combating flammable liquid fires. The success of these tests resulted in Griswold fog nozzles being placed on every crash tender. These low velocity fog nozzles were referred to as Navy "B" head nozzles. This nomenclature derived from the nozzles early design. It was initially designed to afford seamen an effective weapon to combat fires in ships boiler rooms. Eventually the theory was developed sufficiently enough to allow production of mystery and high velocity nozzles that would provide the necessary devices for applying the indirect method of fire fighting. The demonstration of this equipment at RCAF Station Rockcliffe has been detailed in the Appendix to the minutes of the Fire Prevention Officers meeting held in Ottawa 25-28 May 1942. Lloyd Layman, the great fire fighting tactician and equipment innovator, co-incidentally was conducting similar trails at a US Naval dockyard installation in Maryland. He became an advocate of water fog for fire fighting and its special application in the indirect method of structural fire fighting. The results of his trials resulted in the publication of two notable books that became the firefighters bible for structural fire fighting size-up methods and tactical extinguishment manoeuvres. They have been somewhat superseded by contemporary authors, but still afford worthwhile reading by the serious student of fire fighting tactics.

Fire Safety Design Engineering

Construction of several large buildings were undertaken at RCAF Trenton during the 1930's, part of a government make work program. Poured concrete and steel formed the basic building material, this non-combustible design had a further fire safety feature, sprinkler systems installed throughout the project. In effect design authorities of that time were effectively constructing buildings according to sound fire protection principles. A practice thought by many to be of relatively "modern" conception. In contrast, the rush to build wartime facilities was predisposed to ignore the fire protection aspects of building construction which although fabricated from highly combustible material, lacked sprinkler systems. Expediency and economy had become the driving force during this period. Most buildings being considered temporary and therefore not worthy of the added expense, time and material needed to build them according to code. They did incorporate fire safety features of sorts, but these were mainly design considerations for special occupancies such as fuel tender garages. Methods of venting of hangar roofs and installation of fire doors where separation of workshops was desirable, received special consideration.

The Joint Services Fire Committee

The Joint Services Fire Committee JSFC was an off-shoot organization of the War Services Fire Protection Committee WSFPC made up primarily of fire marshals' and their representatives from each of the three services. The brief existence of the WSFPC had revealed the continued need for inter-service cooperation and the mutual sharing of information. By use of this committee style format it was intended to carry out the initiatives started by the WSFP. During their first meeting

they determined their responsibilities to be fire prevention and fire fighting, which would follow the framework similar to the one already established municipal departments. The Committee was unanimous in its commitment to man all flying stations with military personnel. With respect to civilian firefighters working for DND, they would normally be employed at designated depots in or close to urban centres.

Agreement was also reached in respect to the practice of using personnel from other trades to help man fire vehicles, this arrangement had obvious advantages therefore, the committee's recommendation was that the practice continue. From the point of view of security and discipline the committee decided to have the basic cadre of firefighters remain servicemen. These recommendations were re-affirmed in November 1945.

One of the main mandates set forth by the committee was to standardize the method of applying fire safety measures on DND property. In attendence at the first meeting were:

Cmdr (SB) C.A. Thomson-Director of fire safety for the Navy.

L/Col O.L. Lister-Director of Accommodation and Fire Prevention for the Army.

S/L J.E. Richie-Works Fire Prevention Officer

the Air Force.

One of the committee's innovative proposals was to establish a fire safety sub-committee on the east and west coasts. This initiative improved communication and execution of new central committee initiatives. The sub-committee was mandated to meet on a regular basis and discuss problems concerning fire safety and make appropriate recommendations. Intractable problems that extended beyond the sub-committee's authority were forwarded to the JSFC for further consideration and action. The 1943 sub-committee was made up of the following members:

<u>Atlantic Sub-Committee</u>

Lt (SB) W.J. Carson Fire Safety-Navy

Maj B. Currie Fire Prevention-Army

F/L T.H. Mathews Command Fire Prevention-RCAF

<u>Pacific Sub-Committee</u>

L/t (SB) B.O. Nixon Fire and Safety-Navy

L/Col O.L. Lister Fire Prevention-Army

F/L W.A. Carlisle Command Fire Prevention RCAF

The JSFC organization and its sub-committees continued their work from inception in 1943 until the three services were integrated in 1967. Their impact on fire safety was profound and the framework for the delivery of fire safety communication remains unparalleled.

Hangar Line Protection

One of the more critical tasks that firefighters performed was the training of aircraft tradesmen in the use of fire extinguishers. Of particular importance, the 15 lb Carbon Dioxide type, as this was the prime extinguisher used to combat aircraft engine start-up fires. Preferred over other extinguishers because they were effective and left no residue for technicians to deal with. However, the more serious fires or fuel spills called for the forty-gallon foam extinguisher and/or the deployment of the fire department.

Some stations had supervised coded fire alarm systems, Trenton sought to go one better and hooked their fire alarm to an air horn that blasted the surrounding countryside whenever a fire alarm was activated. The air horn would sound the box code, there was a duplicate set of code wheels in a box in the fire hall beside the air horn control. The duty firefighter selected the code wheel that corresponded to the box code placed it in a drum and activated the horn. As the drum rotated it sounded the box code, firefighters responding to the alarm would then proceed to the fire and/or the box. All firefighters and fire piquet within ear shot would be expected to report for duty immediately.

Flight Sergeant George Constable BEM

Although medals were awarded to firefighters (and other servicemen) on active service for various campaigns and theatres of war, one wartime firefighter was the recipient of an award of a more personal nature.

Flight Sergeant, George Constable, an RCAF Fire Chief who was enumerated in the King's Honour List, January, 1945 as a recipient of the British Empire Medal (BEM) for his service during the war. He was born in Fairford, England in 1901, after emigrating to Canada, sometime he later became a City of Edmonton firefighter. George enlisted in the RCAF in 1940 and served in Toronto, Macleod, Regina and North Battleford.

War Ends: Demobilization

When the war finally ended, there was a frenzied scramble by uniformed servicemen to return to civy street. The situation when the war ended was reflected in all three services everyone, (or so it seemed) wanted an immediate release from the armed forces. Firefighters were no exception, many returning to the municipal departments they had left to claim their positions and seniority.

Very few senior NCO's decided to remain in the post war RCAF Fire Service. From a wartime peak of 1,700 firefighters, the service shrank to just two hundred and twenty seven. The post war manpower ceiling for the entire RCAF had been set at 16,100 personnel, of these two hundred and eighty were designated firefighter positions.

By 1947 the distribution of firefighters within the RCAF was as follows:

Central Command, 59;

Training Command, 12;

10 Group Dartmouth, 33;

11 Group HQ, 32;

12 Group HQ, 16;

Northwest Group, 53;

Material Command, 21 and;

Air force HQ, 1.

The total amounted to two hundred and twenty seven, fifty three personnel short of establishment. This small group would form the nucleus of the RCAF fire service as the country entered the Cold War era.

The mass release of firefighters from the military was a significant factor, in the mushrooming fire loss statistics. Fire inspections of buildings, maintenance of installed fire suppression systems and enforcement of fire regulations all suffered from the lack of skilled fire inspection specialists. A diligently applied fire inspection program, carried out by trained specialists would have eliminated many potential fire hazards and guaranteed suppression systems were in operating condition.

The dilemma remained unresolved until following a meeting of the Air Force Joint Fire Marshal's Committee, when a recommendation was made to the Federal Government to raise the firefighter strength in the RCAF from 280 to 560; they felt that as the RCAF was self insured this was a reasonable, cost-effective direction to take. Surprisingly, their recommendations were promptly accepted and positive changes began to take place. Following Canada's involvement in the Korean War, the firefighter strength would eventually be climb to 1,120 personnel and would continue to increase until the mid 1960's.

THE POST WAR ERA

The post-war armed services had a combined budget of $2 million to provide fire services. The Department of National Defence self insured against fire, experienced a one month loss of more than $600,000. The enormity of the destruction underlined the need to maintain a reasonable level of post war fire protection. Fire losses were heavier than expected due in part to the hasty construction methods used during the wartime years. Fire stopping requirements had not been incorporated into the building design. Coupled with the highly combustible construction material and a lack of an adequately manned fire department, provided a recipe for frequent and on occasion, spectacular fires. There was a tendency too, to use buildings for purposes other than for what they were designed, thus complicating an already troublesome situation.

The Army Fire Service also faced severe manpower reductions after the war, along with other branches of the Armed Forces. Fire Protection Officer positions were virtually eliminated, there remained only one major on strength at Army Headquarters. NCO Fire inspectors who had not chosen demobilization, were posted to the Command Engineers Staff.

Mounting fire losses would also play a role in generating a renewed army fire service, plus the grudging acceptance of a moral obligation to provide fire protection services for the remaining army populace. There too, was question of protection for important military installations and the valuable material they housed. Once again, the Army looked to train and re-establish professional fire departments to protect their camps.

In 1946 when the renewal of fire services in the Army commenced, the authorities found themselves in a unique kind of situation, requiring firefighters and at the same time having to watch their trained personnel leaving the military. To combat the rapid depletion of fire fighting personnel, they came up with a series of incentives to keep the few firefighters they had left in the service. They called for volunteers to man the recently vacated fire halls. Personnel with training as firefighters would be given a choice of postings, as near as possible to their home towns. Those without training were sent to a training school (Chilliwack) and graduates would then receive the same posting consideration. The plan succeeded in slowing down the exodus allowing the fire halls to remain marginally manned over the critical transition period.

Professional Rebuilding

In 1946, the Army Fire Marshal organization consisted of two military officers; Major E. Desjardin- Director of Accommodation and Fire Prevention and Captain H.B. Peters assistant Fire Prevention Officer. With such a modest number of officers the Army Fire Service looked optimistically toward expansion and improvement. With re-organization, and the need to train more personnel, Army authorities made the decision to increase the instructional staff at RCSME, Chilliwack. Eventually the organization at Chilliwack included: Major J. Sweeny - Chief Instructor; CSM Bob Wain - Instructor; Sgt Johnny Moore - Instructor and; Captain J.F. Block - School Administration Officer.

A fire fighting course curriculum was developed with a training period scheduled to last four weeks. The course was designed to teach the practical operation of structural fire fighting vehicles, portable pumps, maintenance of fire equipment, hydraulics, fire prevention and the use of portable fire extinguishers. Two additional instructors, were posted in Sgt Roth and Cpl Jacobsen, to assist with the training program.

Reorganization

In 1946, the reorganization of the RCE led to the restructuring of the Army Works Service (AWS). Out of the ashes of this department, there emerged a new directorate, the Directorate of Works and Accommodation (DWA). This was the product of consolidating three previously separate directorates, they had been; Works and Construction; Accommodation and Fire Prevention; and Engineering Accounts and Stores.

The 1947 decision established a lieutenant-colonel, as Fire Marshal of the Army with a captain as Assistant Fire Marshal at Army Headquarters in Ottawa. A captain would head the Fire School in Chilliwack, supported by a staff of twenty instructors located at the school and the command headquarters.

Volunteers from other branches of the Army in large part staffed the camp fire brigades. They received their training by a combination of on-job-training and formal training carried out in Chilliwack. This was somewhat of a stop-gap measure until the Army received approval to organize a permanent peacetime, fire fighting force. Eventually the whole of the army fire service would be staffed by DND civilians, much in the same manner that it is manned today.

The size of the post war Army increased which demanded an increase in infrastructure, particularly in personnel married accommodations (PMQ) a building type not given much emphasis during the war years. The first major construction program named The Home Station Development Programme meant to rehouse the army in permanent type buildings began. It encompassed almost every conceivable building type. The scope of the construction received the attention of fire inspectors, who were required to review engineering drawings, write specifications for fixed fire suppression systems and conduct seemingly endless acceptance tests of installed equipment.

Another significant change took place in 1952 when the DWA separated into two distinct directorates, Quartering, and Works. The Fire Marshal's office came under the command of the Works Directorate.

A Canadian Army, Manual of Army Works Service Fire Safety (Interim) was issued in 1954 under direction of the Chief of the General Staff, by the Quartermaster General. It was a significant publication in that it provided a much needed reference that legitimized action on fire safety violations. Quotable, authoritative references concerning safety which fire inspectors could use were rare before this publication was released. Although there had been the Fire Services Manual for the Canadian Army (1948) which seemed to have been used exclusively by firefighters and not by the population at large.

Special Committee on Working Conditions

In August, 1956 a special committee met in Ottawa, to review the working conditions of civilian firefighters employed by the Department of National Defence (DND). The meeting was chaired by Lieutenant-Commander W. Simpkin, Director of Fire Fighting for the RCN. At the request of union officials DND provided representatives from each of the three services. They included: Flying Officer Barrett of the RCAF Fire Marshal's Office; Mr A.D. DesRoches of the Army's Fire Marshal's Office and Mr E. Lane from the Deputy Ministers Office.

A brief presented by a union spokesman, outlined the deplorable working conditions (Union description) at some of DND's fire departments. It included working hours, uniforms and a general overview of the concerns widespread among civilian firefighters in the employ of DND.

The committee's recommendations that stemmed from the Ottawa, meeting were to set the tone for the future conditions of employment. The improvements undertaken were manifold in nature and went a long way to improve the individual firefighters working environment.

RCE Firefighters in Germany

In the early 1950's the Canadian Forces deployment to Germany, included an Army brigade group that was to form an element of the British Army of the of the Rhine. A works company was created in 1951 to reconnoitre the forts that had been set aside for Canadian occupation in northern Germany. They were to form a component of the advance party for 27 Canadian Brigade Group. Eventually, they would oversee the renovation and construction of accommodations located close to the villages of Soest, Werl and Iserlohn. After considerable expenditure of time,effort and money by the Army Engineers, the construction was completed in 1953. Hiring of a totally civilian engineering support section from the local populace was not considered to be desirable, so an Engineer works service section was incorporated into the brigade group. Part of its responsibilities included fire protection services.

The works company had a fire fighting force of approximately fifty-one German National's, an RCE fire inspector who acted as a Fire Chief and a bilingual German National, Deputy. The Deputy provided interpretation services, when the situation demanded.

Spread out among the Brigade area, the fire fighting force was housed in several small fire halls. The basic fire hall design consisted of an office, single bay garage for the fire vehicle, a small maintenance shop, kitchen/lounge and sleeping accommodations for four firefighters.

Volkswagen manufactured the first generation of fire trucks purchased for use by the brigade. These vehicles came equipped with a small pump (under 500 gpm capacity), 75mm and 52mm hose, plus an assortment of fire fighting tools. A modest piece of fire fighting apparatus, but proved nominally effective in its forecast role.

Mutual aid formed part of the brigades commitment to the local area, similar in many respects to the mutual aid agreements practised in Canada. The commitment to serve the local area with fire protection services proved to be a solid method of cementing relationships with the local populace, perhaps one of the best public relations initiatives devised.

The following anecdotes were provided by Flight Lieutenant John Cowell. It seems that the Air Force Fire Marshal was on a visit to the Air Division, and while in Germany decided to visit the Army facilities in the Soest area. The firefighters with fore knowledge of his pending arrival were primed to perform at their best and possibly amaze the visiting dignitary with their fire fighting proficiency. The Fire Marshal duly arrived at Fort Henry and asked to see a combined hose and ladder drill. After selecting a suitable building, he then proceeded to outline the type of drill he envisioned. In due course the drill got underway, it consisted of laying out two hose lines, charging them with water and then setting a ladder up against a nearby building. A fairly straight forward evolution, and to the crews credit everything was going along quite well... until it was time to put up the ladder. The fearless crew boldly unloaded the ladder from the truck and placed it upright, intending to extend it in order to reach the roof. But try as they may, the ladder refused to extend as they pulled on the rope, tugged, twisted all to no avail,it just would not extend. Realising the cause of the crews dilemma the Fire Marshal walked quietly over and much to the chagrin of the fire chief, explained that they had positioned the ladder upside down! Not exactly a banner day for the department, but there again these things happen especially during drills.

Not content with destroying the morale at Fort Henry the intrepid Fire Marshal continued his odyssey travelling this time to Fort MacLeod. There, our ever curious fire marshal decided to get a close look at one of the German built fire trucks. Vehicles he was not familiar with. The accompanying entourage of local dignitaries followed the fire marshal until he stopped and opened one of the vehicles compartment doors. It was a compartment that housed all the important pump control levers. On opening the door, he found a lawnmower jammed into the compartment, effectively denying anyone access to the pump controls. There was virtually no way to use the pump without removing the offending article. The mower gamefully resisted the best efforts of all concerned when they tried to remove it however, after some time, and a fair amount of cussing they finally managed to extract the mower. It turned out that the mower was going to be used to cut the grass around the fire hall. When the crew had picked it up at the CE section, they discovered there was no place on the vehicle to carry it except in the compartment.

On returning to the fire hall they found coffee break in progress and they all had promptly settled down to enjoy their break. Leaving the mower securely lodged inside the compartment. Had there been a fire of any consequence during this time there would have been even more red faces than there were evident at the Fire Marshals discovery! The Fire Marshal's visit to the Forts of course was not all red faces and apologies, usually he found the departments well run and in a good operationally `ready' state.

Further Expansion and Training

The Army's commitments in Europe, the Middle East and Canada, had resulted in a shortfall of fire safety inspectors. The career manager was tasked to recruit twelve members from the combat arms to train and fill this short fall. The twelve chosen (something biblical here?) were sent on a four week course, after graduation they were posted to the various command centres for two years of on-job training. On completion of the two years of on-job training and they returned to Chilliwack for a five month advance course. Since these students were exempted from extra duties and parades all finished their training well ahead of schedule. Graduates from these courses were extremely well trained, well grounded in the complexities of fire engineering review and fire code interpretation.

Army Fire Safety Inspectors operated out of Army Headquarters in Ottawa and all command headquarters. Their responsibilities included carrying out on-site fire prevention inspections; visitations to armouries where they would give lectures and fire fighting training to the Militia and submit the obligatory reports to commanding officers. Additional responsibilities involved overseeing the many camp fire departments. Although strictly speaking the inspectors belonged to the works company administrative organization. In 1962 they attempted to recruit bilingual senior NCO's from the combat arms as fire inspectors. This was only partially successful for they managed to graduate only two inspectors.

UN Duty

During the start of Canada's participation with the UN Forces in the Middle East, a serious fire occurred in a Military Hospital in Haifa. As a result, a request for fire safety inspectors was made to the Army Headquarters in Ottawa. As a result, a Senior NCO fire inspector was added to the Canadian UN Contingent. On arrival at the UN base, the Fire Inspector discovered he had inherited a fire department with one fire vehicle of doubtful vintage, manned by a largely untrained crew of indigenous Arabs! His most pressing task (and frustrating) was to train the fire crew to an acceptable standard which expended many hours in the process.

Day-to-day duties in the Middle East were much the same as they would have been in Canada, extinguisher maintenance, inspecting buildings for fire hazards, conducting training sessions and directing fire fighting operations. The joys of working in the UN organization had to be experienced before the average individual could appreciate them. To often utter frustration was the underlying sensation, following each attempt to introduce a program intended to improve fire safety. The UN bureaucracy it seemed was finely tuned to defeat any initiative set forth by the Army inspector. That, of course, was only a perception, but one that appeared only too real to the individual involved.

Military or Civilian the Navy Decides

The RCN Director of Fire Safety held a meeting in February 1945 to discuss the fate of the Naval fire service following the anticipated transition to a peacetime posture. The committee had to decide whether to convert fire protection to a civilian service or a branch composed entirely of naval service personnel. A strong deposition was made to establish an all military fire fighting

service for the dockside navy. The pros and cons of civilian versus military were well documented, cost analysis was detailed almost to the extreme. The conclusion set forth in the final document supported the recruitment of civilian firefighters to man the dockside fire departments. Having read this report which is only initialled (the covering letter has been lost somewhere along the way) the overriding reason for the decision (the report indicated) seems to rest on the fact that "the present civilian department is composed of war veterans and is very efficient and conscientious body...." Therefore the recommendation was to retain the civilian composition and to increase its strength. It was initialled R.McL. These changes were scheduled to come into effect in June 1946 with serving firefighters members being offered the chance to stay on in a civilian capacity.

One of the overriding reasons for promoting a civilian dockside fire service as apposed to one composed of military members, was the Treasury Board's decision not to raise the manning levels of the post war RCN. However, they were agreeable to an increase in civilian manpower. Civilianizing the dockside fire service was a manoeuvre that the Navy's Director of Fire Safety, Commodore C.A. Thomson and the War Service Fire Prevention Committee had actively promoted for sometime. They had long realized that this move would protect hard seagoing manpower positions which would make the arrangement far more palatable to the naval brass.

A memorandum dated October 14, 1947, prepared by the Principal Supply Officers Committee, surveyed the entire fire fighting picture for all three services from the points of view of past experience, present situation, proposals or requirements, and financial aspects. It stated that the cost of a service of 256 civilians for the navy, 277 civilians plus 10 soldiers for the army, 414 airmen plus 16 civilians for the Air Force, a total of 973 men, would be $2,086,000.00 per annum.

In a ministerial submission dated December 16, 1947, by Mr. B. Claxton, Minister of National Defence, stated that the Defence Council had approved for the Department of National Defence the following policy regarding a fire fighting service:

> a. Fire fighting organizations would be established permanently in the Services; and
>
> b. Fire fighting organizations be manned by service personnel or civilians, depending on location and circumstances.

Establishment and Entrenchment

In January 1949, during a meeting of the Treasury Board, participants were asked to consider the requirement for a regularly established fire service for the defence forces. They agreed in principal that there was a definite requirement to maintain a competent DND fire service. The decision as to whether this force would be made up of civilians or military members would be left to the minister responsible. It was a significant meeting, in that it reaffirmed establishment of the fire service as an necessary part of the Canadian Military Structure. The outcome of these

high level meetings was the permanent establishment of a fire service manned by both service and civilian firefighters.

Air Boatswains

Although naval shore fire fighting was to be carried out by civilians, the Navy still had its complement of Boatswain/Firefighters on its aircraft carriers. The Canadian Navy had her aircraft carriers, first Warrior, then came Magnificent and finally Bonaventure. The Air Boatswains or Air Bos'ns in Navy vernacular made their home on board ships carrying out a myriad of duties including fire fighting.

In 1945 Canada took delivery of her first carrier, HMCS Warrior, from Britain. Its arrival spawned a tradesman known in official circles as Aircraft Handler. Duties afloat consisted of parking, securing and moving aircraft on the flight deck plus fighting any aircraft fires that occurred. The duties were carried out on pitching, unsteady flight decks and were never what one might call `routine' conditions. Shore duty was normally spent at bases like HMCS Shearwater, where they would be tasked with every job conceivable, ranging from fire fighting duties to driving VIP's, and pumping gasoline.

In 1949, they were bestowed with a new name Aircraft Controlman with all the trappings and prestige that went with this award. Previously, they had to compete on the seaman's roster for promotion and now, finally, they were able to develop their own promotion list. The Aircraft Controlman's duties were expanded to include aircraft handling, crash rescue and fire fighting ashore, as well as afloat. Plus some air traffic control duties. In keeping with this new title, many were sent on air traffic control courses at RCAF Station Centralia while a few senior members were sent to Quonset Point, Rhode Island for advanced fire fighting courses. At this time, the Navy chose to introduce the Observer Mate Branch with the first candidates taken exclusively from the Aircraft Controlman trade. This resulted in a serious drain on the trade with many of the brighter lights leaving to join the newly developed branch.("Requiem for the Air Bos'n" MWO D.J. Murphy.)

The 1960's brought a new bright and shinning designation, Naval Airman. This was a result of the amalgamation of the Aircraft Controlman and the Safety Equipment Branch. Eventually, cross training made the two branches indistinguishable, completely inter-mixed.

In 1966 rumours of impending integration were now running rampant through the armed forces, shortly after this occurred, reclassification of branches and trades began. With the reclassification, the Naval Airman disappeared. Initially, he was given a choice of employment in other available trades. This decision met with stiff opposition from the naval pilots and naval airmen, so much so that a new designation was established-the Air Bos'n Branch. Former Naval Airmen were given the chance to re-muster to Safety Equipment or Air Bos'n. Air Bos'n trades training would then include structural fire fighting.

The 1970's arrived and Canada lost its only remaining aircraft carrier the HMCS Bonaventure, after an extremely expensive refit. When this happened air bos'ns were posted to RCAF fire halls across the country. On 1 July, 1972 the Air Bos'n trade was officially dissolved and all 581 Air Bos'n tradesmen were compulsorily re-mustered, becoming MOC 651 firefighters. The last vestige of this trade may still be seen on-board the DDH helicopter destroyers and AOR replenishment vessels however, today, the majority of personnel wear air force blue.

Personnel

The immediate postwar period was witness to several changes of personnel particularly in the hierarchy of the RCAF fire service. The release of Squadron Leader Richie left the senior staff position at AFHQ vacant. His replacement was Wing Commander W.D. Martin, a Civil Engineer with the Directorate of Works and Buildings. During this period, Warrant Officer First Class R. Armour was commissioned as a fire officer and posted to AFHQ as the Senior Works Fire Prevention Officer. In spite of receiving his commission, he was persuaded by a fire vehicle manufacturer to forgo his military career and join them in a civilian capacity. This sudden departure resulted in Warrant Officer B. Quinn being selected as his replacement and posted to AFHQ. He was subsequently commissioned with the rank of Flying Officer.

Increases in manning levels created a shortfall of trained personnel to fill the vacant positions. Senior staff at AFHQ attempted to overcome the shortage by recruiting newly released wartime firefighters. Before the backlog was fully addressed, trained firefighters from as far afield as the British Isles, were recruited, some of whom rose to prominence within the RCAF Fire Service.

In 1952, ex-Flying Officer W.(Bill) McCallum, then a senior officer with the Toronto Fire Department was approached with an offer of a short-term commission. The offer was made in order for him to take over the position of Works Fire Prevention Officer with the rank of Squadron Leader. McCallum, who was already planning to retire from the Toronto Fire Department at age 60, happily accepted the offer. He became the officer responsible for fire protection personnel during the build-up of the armed forces in the early 1950's. In 1956, he was promoted to the rank of Wing Commander at the tender age of sixty-three. An amazing individual with a exceptionally interesting career history. His many achievements include: World War One veteran, (youngest warrant officer in the Canadian Overseas Army) senior officer in the Toronto Fire Department, Second World War Fire Prevention Officer and finally, Chief Fire Prevention Officer for the post war RCAF.

An interesting footnote comes from an article printed in the `Trenton Contact' dated March 1942. The article in part states "There are four instructors representing sixty-seven years of collective fire fighting experience, headed by Flight Sergeant T.H. Matthews, a former member of the Toronto Fire Department. His assistant Sergeant C.W. Pollard a westerner from the Regina Fire Department, third in charge is Corporal C.A. Thebarge, a past Lieutenant in the Ottawa Fire Department, and finally Corporal F. Wilson. All four claimed to miss the presence of their former Chief, Flying Officer W. McCallum, now stationed at Winnipeg and for whom they have

great admiration". This was a splendid endorsement from a group of professional's who, in their own right, had considerable background and experience as fire fighting professionals.

In 1988, Wing Commander Bill McCallum, passed away in Toronto, at age ninety three.

Recruitment and Training

The end of the war witnessed the departure of large numbers of firefighters from the ranks of the armed forces. This unparalleled exodus created a shortage of firefighters needed to carry out fire inspections and to provide an effective emergency response team.

After suffering a series of costly fires, the RCAF initiated a recruiting program aimed at increasing its number of firefighters. As a consequence, the fire school at RCAF Station Mountain View reopened in late 1946. The school again became part of the Composite Training School (KTS). To avoid confusion between Composite Training School and Conversion Training Squadron, the letters KTS signified Composite Training School, when abbreviated.

Flight Sergeant A.(Bull) MacFadyen, was appointed Chief Instructor, he was assisted by two corporal firefighters. Among other notable instructional staff of that time were, Flight Sergeant Jock Smith and Corporal(s) Cowell and Wilson.

The imposed haste to fill the vacant positions meant that some six week courses became seriously overloaded. One course had a grand total of 65 students! Expediencies of the service being what they were, the speedy training program was allowed to continue. In 1947, the school moved from Mountain View to accommodations at RCAF Station Trenton, where it remained until 1948. Unfortunately, short-sighted policy makers would again close the training facility at Trenton, in the process losing the instructional expertise that had been developed. History would again repeat itself and under the leadership of WO1 D. Lefebvre, the fire school once again reopened in 1950, at RCAF Trenton. Through the incompatibility of large volumes black smoke produced by firefighter training, the fire school would subsequently move from Trenton to Aylmer and finally to its permanent home in Camp Borden where it continues today, as `Home of the Armed Forces Firefighters.'

The Fire School at Borden became firmly established, under the leadership of its Commanding Officer Flight Lieutenant A.(Bull) McFadyen. After taking possession of three vintage aircraft hangars (circa 1918) they were quickly converted to classrooms, vehicle storage and equipment maintenance shops. Eventually the training facilities would include a large (thirty acres plus) fire practice area, underground fuel storage tanks (approx 20,000 gallons capacity) with a pumping system able to deliver flammable liquid (JP4) to the practice burn area, steel bodied mock-up's that could simulated a burning aircraft fuselage, a structural fire training tower and a separate building that housed fire alarm and sprinkler system training simulators.

In 1970 following armed forces integration, the RCAF Fire School changed its name to Firefighter Training Company (FFTC). This became necessary after it was designated an integral part of the Canadian Forces School of Aerospace and Ordnance Engineering,(CFSAOE). With the break-up of the CFSAOE organization in 1985, the Firefighter Training Company became the Canadian Forces Fire Academy (CFFA).

The role of the Academy remains very much the same as it was in the beginning, to conduct individual training in all aspects of fire service duties. Including: fire safety, loss limiting engineering, fire prevention, enforcement of fire codes, regulations and orders, fire protection systems, structural fire fighting operations, aircraft fire fighting operations, emergency response and on-scene emergency site management and situation control.

Completion of updated aircraft mock-ups, construction of two additional concrete training towers, a modern fire simulator for training senior fire service members and several new maintenance and training structures have gone a long way to serve the long term aspirations of the Canadian Forces Fire Academy.

The acquisition of these first class facilities were the results of far seeing senior firefighters, who were determined to make CFFA, the finest fire training institution in Canada. It was a credit to their drive, foresight and pragmatism that these fine facilities were ultimately established.

With the development and construction of facilities dedicated to firefighter training completed, the need to find a permanent instructors became critical to the school's success. Full time staff were necessary to blueprint course instructional material, lesson plans and training schedules. There was also the requirement to establish a cadre of personnel with the requisite level of instructional expertise. To meet this aim there was an urgent need to `train the trainers.'

The main drawback that faced those seeking more technical knowledge was the limited sources where information was available. Canadian colleges and educational institution of that time did not offer the type of courses required. In fact, today there still remains a lack of technical colleges and universities in Canada, that offer advanced courses in fire technology.

To solve the problem, school instructors and selected firefighters attended seminars and courses at universities in the US, universities which offered the desired curriculum, such as Purdue University (fire investigation) and the University of Oklahoma. They also observed United States Air Force training methods and fire fighting exercises. Attending fire suppression courses at the laboratories of Underwriters, Factory Mutual and the National Fire Prevention Association, (NFPA) proved extremely informative. The fallout from the information acquired by personnel attending these courses was the growth of each individual instructors professional knowledge, knowledge that he was able to pass on to his students. It also had another positive spin-off effect, producing a heightened awareness of the technical advances being made by professional institutions outside the Canadian military.

The pursuit of technology beyond the normally accepted boundaries was an imaginative undertaking, that could only enhance the professionalism of the fire fighting school as an credible institution.

PUMPER DEVELOPMENT PROGRAM

The Code 30 (later redesignated the G10) pumper was the principal structural fire fighting vehicle of the post- war era. A left over from the war years, the Code 30 would need a complete overhaul if it was to remain in service or, failing that, replacement. With money for the purchase of new vehicles in short supply, a decision was made to modify the vehicle from top to bottom using available maintenance funds. The chassis was reinforced to accommodate the upgrade which included carrying a forty-foot extension ladder over the hose bay and open cab. At the Bickle Seagrave fire fighting equipment plant in Woodstock Ont, the rotary gear positive displacement pump was replaced with a centrifugal pump, the 80 gallon capacity water tank was removed and replaced by a 300 gallon tank. The Code 30 then underwent a major overhaul of its engine and drive train at the 6 Repair Depot, Trenton. In total, seventeen of these vehicles were modified. Nonetheless, as the saying goes "you can't make a silk purse out of a sow's ear" and the project was abandoned. Shortly thereafter, an equipment renewal program was introduced which necessitated buying new vehicles.

The G9 Triple Combination Pumper

Designed by Bickle Seagrave of Woodstock Ont, the G9 was the first pumper to enter military service with an enclosed cab. Although motoring around exposed to the elements in an open cab appealed to the more masochistic who loved the biting sting of the elements while driving. The widespread consensus among the more continent was overwhelmingly in favour of the enclosed cab along with a much coveted heater. There was however, a flaw in the vehicle fire fighting package. As its mid-vehicle mounted 600 gpm, two stage centrifugal pump, was undersized for use at the larger stations. After some debate and further evaluation, another contract was issued for the purchase of a vehicle with a pump capacity of 840 gpm.(one thousand US gpm). This was the accepted standard for a post-war class A pumper. Today, the standard pumping capacity for a class A pumper in the US and Canada dictates an output of 1000 Imperial gallons per minute.

Even pump capacities can have the ability to confuse the unwary. A case in point was the confusion that arose over the fact that Canadian manufacturers were buying US made pumps (there were no Canadian built fire pumps at the time) that were listed as 1000 gpm capacity. Naturally Canadian purchasers (DND included) accepted the rating label at face value expecting Imperial Measurement, when in fact it was US. It was some time before some diligent experimenter realised the error and promptly suggested the listing should reflect 840 gpm rather than 1000. A modest observation point, but nevertheless, one that could loom large during calculations of routine service tests etc.

The G11 Pumper Triple Combination Pumper

The air force took delivery of the Thibault G11 pumper in 1953. Unfortunately, the first model proved to be tail heavy, but redesign eliminated this fault in later models. Pump capacity conformed to the standard of the time, 840 gpm at 150 psi. It also had a four-stage high pressure pump and an integral 500 gallon water tank. As a good solid piece of fire equipment, the G11 would give many years of dependable service. One thoughtful feature was the placement of the pump panel on the kerb side of the vehicle, to allow the operator to keep out of the way of passing traffic. Note: This feature was available only on the LaFrance built G11 pumpers, the other two manufacturers kept the controls adjacent to the drivers position. The whole issue of positioning of the pump panel became something of a controversial topic of debate, with protagonists of the LaFrance concept on one side and others who did not see the issue as being that acute. This whole question of pump operator safety has been somewhat neutralized by the positioning of the pump controls amidships on the new generation of pumpers, scheduled for delivery in 1993.

The only serious drawback the G11 had was that it came with only two-wheel drive. This shortcoming was corrected with the delivery of the G8 pumper. In fact it was Squadron Leader (at the time) McCallum who was instrumental in convincing RCAF authorities to purchase four wheeled drive fire vehicles.

The G8 Triple Combination Pumper

The purchase of the G8 pumper ushered in a new generation of structural fire fighting vehicles. Built by Pierre Thibault Company, it was manufactured as all fire fighting vehicles tend to be, of a composite of various fire equipment and vehicle parts. However the combination in this case produced a thoroughbred. The chassis was a 4X4 design built by FWD, powered by a Wakashaw straight eight with a duel 24 volt ignition system and a Waterous Class A, 840 gpm two stage centrifugal pump rounded out the main components.

It also had a four-stage, high pressure pump that was connected to two high-pressure hose reels located on either side of the vehicle. Incorporated into the high pressure unit was a hydroblender system that could be used to lessen the surface tension (soften) of the water it produced (normally referred to as wet water). This was a desirable agent when fighting small, deep seated fires in mattresses, upholstered furniture and similar material. Unfortunately, the hydroblender agent that created the wet water action clogged lines and its overall value vis-a-vis using plain water was placed in question. Eventually the hydroblender unit was scrapped.

Subsequent pumpers would not have the high pressure pump, hose reels or hydroblender features incorporated in their designs. A side bar to this rationale was the belief of some authorities, (not only military) that fire crews arriving scene of a fire, would commonly employ the use of the small high pressure lines, in an almost automatic reaction. These lines, although light and quick to bring into action, invariably could not produce the volume of water necessary to control sizable fires. This occasionally resulted in some fires getting out of control. The unanimous

consensus among tactical fire experts was their belief that the minimum size hose for effective initial attack was 12 inch lines fed from the main pump. Universal acceptance of this principle effectively killed the high pressure pump-hydro blender concept. What that old saying? "what goes around comes around" the latest pumpers have a class A foam feature that meters foam directly into the main pump. This innovation as well as providing an on-demand foam capability, dispenses a `wet water' solution to the handlines. An old idea characteristically refined for the 90's. If you want a new idea read an old book!

The G8 also carried a foam proportioner designed to use directly connected to the 22 inch discharge ports. This enabled the G8 to fight medium-sized flammable liquid fires, or provide a secure vapour seal over fuel spills. Extension of this idea would later led to incorporation of an integral foam tank with a forty gallon capacity.

Rounding out the G8's major equipment inventory was 1200 feet of 22 inch hose, 300 feet of 12 inch hose, forty and twenty four foot extension ladders, and a myriad of ancillary fire fighting equipment. By incorporating a simple,virtually trouble free pump operation, and mechanical breakdown a rarity, the rugged no-nonsense G8 could hold its own today.

THE KOREAN WAR ERA

Canada, like so many of its allies began to expand its military forces, at home and in Europe. In April 1949, Canada signed the North Atlantic Treaty and the Armed Force's rebuilding program began in earnest. By 1954 Canada had an Air Division of twelve fighter squadrons and an Army Brigade based in Europe. Further motivation for expansion of the Armed Forces occurred in June, 1950 when the Communists attacked South Korea. The immediate reaction in the Allied countries to rearm and expand their forces naturally included the armed forces firefighters, thus the firefighter continued its overall development.

Home Defence Measures

Canada and the United States had agreed to consolidate their air forces for the defence of North America. It was to come under an organization called the Canada - USA Regional Planning Group (which became a NATO Command and then ultimately changed to NORAD). One aim was to create a defence screen, a network of aircraft control warning units (radar) constructed to give early warning of an enemy attack. These lines called the Pine-Tree Line, the McGill Fence (or Mid-Canada Line) and the DEW (Distant Early Warning) Line. These new units often isolated, all demanded fire protection services. World events were shaping the Canadian Forces and with them, the military fire service.

Enter Dry Chemical

In 1948, the first post war northern exercise, code named Sweet Briar revealed several inherent weaknesses in the type and quality of equipment available for crash fire fighting in the north. The Code 33 crash tender's main fire extinguishing agent was water based, the vehicles lack of insulation allowed the water lines to freeze. An additional problem was the limited capability of the vehicle's fire fighting package to extinguish flammable liquid fires..

Sodium bicarbonate (Dry Chemical), the heralded panacea of extinguishing agents had only just made its way to centre stage. Initial use of dry chemical extinguishing agent was confined to fire extinguishers that included, first aid hand held units and 300lb wheeled units. However, innovative firefighters immediately began experimenting with the agents fire suppression potential when married to a suitable fire truck.

The RCAF Fire Marshal's staff carried out trials on the new agent at RCAF Station Uplands using the 300lb wheeled units, transported on the bed of a truck. Conducting the trials were Warrant Officer's Walker, Sacho and MacFadyen. Witnessing the event was Flying Officer Bert Quinn AFHQ and representatives from the USAF, United Airlines, the United States Navy and the US Fire Underwriters Association. The dry chemical trials were an unprecedented success, particularly when a modified vehicle was able to carry four of the 300lb units. Despite some inherent weaknesses dry chemical had now made its way to the front line of aircraft crash and flammable liquid fire fighting. Due to their close involvement with sodium bicarbonate and the surrounding publicity, for a time the firefighters were referred to by pilots as soda jerks. Not however, in a derogatory fashion Gerald Waring notes in the Trenton Contact.

Dry Chemical Tests and Trials

Dry chemical provided the firefighter with a weapon that comprised outstanding flame knock-down capability, compared to the existing foam or water fog agents. Accordingly, there was an immediate desire to deliver this agent rapidly and in large quantities to the scene of a fire or aircraft crash site. Innovation was the order of the day, and with the help of several CE plumbers, a G15 Crash Tender was modified to carry four 300lb wheeled extinguishers. Although this modification did not prove to be a complete success it did open the way for the future evolution of a truly efficient dry chemical crash truck.

Fire fighting tactics also had to be modified to maximize the new agents potential. Dry chemical's main weakness was its inability to vapour seal a fire area, flames left flickering in hidden pockets readily reignited concentrations of fumes causing a condition known as `flash back.' Flash back fires were frequent and techniques to maximize the dry chemical's strength's had to be learned and practised.

Dry Chemical Crash Trucks

Bickle Fire Truck Manufacturing of Woodstock, Ont and the Ansul Company of Marinette, Wisconsin united on a contract to build a 4000lbs dry chemical truck. The result of this collaboration was a vehicle equipped with two, 2000lbs steel tanks to contain the dry chemical and eight 400 cubic foot nitrogen cylinders that would provide 3,200 cubic feet of extinguishant propellant. Agent delivery was via two manually operated turrets mounted over the cab and by two one inch diameter high pressure hose reels, located on either side of the vehicle. Due to the back breaking work involved in recharge operations and unwieldy handling characteristics it became known as the `monster.' Its official title was the Code G18, Dry Chemical Crash Truck.

The design of the G18 was basically flawed, chiefly because of the immense weight of its fire fighting package. Recharging the fire fighting agent took too long and the vehicle's handling was very cumbersome and difficult for even the most experienced drivers. As one firefighter remarked "it took a ten-acre field to turn it around," not exactly a drivers dream truck. To its credit, the G18 did have an impressive fire killing package when it did arrive at the fire. On the plus side, technical knowledge and innovation techniques learned while developing the G18, were invaluable. The pay-off came when it was time to engineer the next generation of dry chemical trucks. After much deliberation it was finally acknowledged that installing 4000 lb of dry chemical on an initial crash response vehicle, with all the other necessary equipment was impractical. Designated light rescue vehicles, the new generations of dry chemical vehicles with slimmed down pay loads of 1000 lbs of dry chemical maintained their excellent flame knockdown capacity. The reduced weight allowed for the incorporation of the desired features-speed and off-road capability.

Built in the early 1950's the G13 would become the first vehicle to use the title Light Rescue Vehicle, carrying one thousand pounds of sodium bicarbonate agent mounted on a Ford 4X4 chassis. It was an excellent vehicle that successfully performed a variety of functions for the fire department crews. Capable of knocking down a large fire and frequently achieving complete extinguishment unaided. There is a common belief among today's firefighters that dry chemical is an extinguishant reserved for three dimensional fires. Perhaps with today's superior foam knock-down capability this may be so, but when dry chemical was used along with protein foam it provided a much needed flame knock-down capability. The term three dimensional, although in routine use today, did not enter the firefighters vocabulary until the late 1970's.

Although the concept was understood. Indisputably, the G13 was a first class addition to any fire department's mobile inventory. The front mounted winch performed a myriad of tasks from releasing aircraft from barrier engagements, to pulling stray cars out of ditches following an evening of serious celebrations. In 1964 an International chassis replaced the venerable Ford, but did not quite realize the success achieved by its predecessor. Notwithstanding, the G13 had a long and successful life from introduction in 1957, to 1982 when it was replaced with the 2000 litre Rapid Intervention Vehicle (RIV).

Larger aircraft demanded larger and faster fire vehicles to cope with increased fuel and passenger loads. The speed of acceleration for major fire vehicles was increased from an accepted zero to fifty miles per hour in under sixty seconds, to a new criterion of fifty miles per hour in under

twenty seconds. Vehicle fire fighting payloads were increased from three hundred to two thousand imperial gallons of water. Not including the one hundred to two hundred gallons of foam making agent.

The NFPA Standard for Aircraft Rescue and Fire Fighting Vehicles NFPA 414, would ultimately specify the optimum design, performance, and acceptable criteria for aircraft rescue and fire fighting equipment for rescuing occupants and combatting fires in aircraft.

Protective Clothing

Firefighter protective clothing in the early 1940's had remained relatively unchanged since the end of the First World War. Helmets were constructed of bacalite or leather, complete with the standard elongated rim to afford neck protection or when reversed provide radiant heat protection. The coat was a black, three-quarter length, water resistant garment named the Petch Coat. Hip rubber boots that came up under the coat and `chopper' leather mitts completed the ensemble. Interestingly, this style of firefighter protective gear is still worn by many civilian departments, both in Canada and the US, particularly in volunteer manned departments, where cost is a very real factor.

An asbestos proximity suit was available for aircraft or severe flammable liquid fire fighting operations, however, the suit was extremely bulky and clumsy to wear, it also readily absorbed water that tended to add to its already considerable weight. It was not a popular piece of protective equipment, but it was one that served the firefighter well ~~appreciated~~ when fighting vigorous flammable liquid fires.

In the late 1940's, trials began to test a protective clothing material of duck type fabric. As a result, a new style of protective gear emerged that became known as a Bunker Suit, incorporating a functional short coat and separate trousers. It was an innovative design that met instant approval from those who tested it. Unfortunately, the Bunker Suit was not placed on general issue until January 1960! A similar suit was later produced made of aluminized asbestos unfortunately, it had a brief and somewhat unfavourable debut, mainly because of a flaw in the thread used to stitch the suit together. The short woven, heat resistant thread fibres had little natural strength, allowing the seams to continually break apart. It was eventually withdrawn from service and never reappeared. This was unfortunate in some respects because the concept of using a reflective type of material had merit, manufactured with an improved thread may have proven its worth.

Breathing Apparatus

The title `smoke eater' was a designation worn with more than a little pride by firefighters. It was coined during the early years, principally because fire fighting equipment did not include a functional self-contained breathing apparatus. The image of the firefighter rushing into what may be a life threatening situation without regard for personal safety held a certain heroic type of

appeal. Firefighters and medical authorities were unaware or did not fully understand the adverse effects that long term smoke inhalation could have on an individuals health.

During the Fire Protection Officer's Conference held in Ottawa, April 1941, the issue of breathing apparatus for firefighters was discussed. Participants at the meeting included Wing Commander N.H. Robinson chairman, and Mr. W.F. Clairmont the Dominion Fire Commissioner. Fire protection officers attender's represented their respective Air Force Commands. During the meeting F/O McCallum raised the issue which involved the acquisition of suitable respirators for use by the fire service. Fight Lieutenant Snarr (representing Air Force HQ) replied that an investigation was being made into the possibility of adapting the Service Respirator to make it proof against carbon monoxide. Following further discussion, all attenders unanimously recommended that the breathing apparatus known as the All Service Mask of a type approved by the Bureau of Mine Safety, should be purchased.

This decision marked the introduction of an approved breathing apparatus into the RCAF fire service. Recommended scale was an assignment of two units per truck, with sufficient reserve canisters to conduct protracted fire fighting operations.

The All Service Apparatus operated on a single canister filled with the chemical Hoplite. Air was drawn into the canister by the wearer where the chemical contents converted the dangerous carbon monoxide (CO) into harmless carbon dioxide (CO2).

There was however, a serious operational flaw with this unit, during the employment of the apparatus there had to be sufficient air in the atmosphere to support life. Not the most desirable feature for a life support breathing system, specially given the expected scope of its use during fire fighting operations. Understandably, this shortcoming would prove to be its downfall and it was eventually replaced.

The Chemox

Manufactured by Mine Safety Appliances (MSA), the Chemox breathing apparatus became the next generation of breathing apparatus. This apparatus, a self contained re-breather type of unit would prove much more effective than the All Service type. The wearer could rely on the ability of the apparatus to supply breathable air, even in the most hostile conditions. The Chemox was the first truly self- contained breathing apparatus, used by the Armed Forces. Future modifications to this apparatus would generally centre around extension of the canisters useful working time and the ability of the wearer to start the canisters quickly in low ambient temperatures. Typically, this involved firing one of the Quick Start Candles which would `jump start' the chemical reaction in the canister, needed to produce breathable air. The candles were also used as an emergency air supply, contributing an instant quantity of breathable oxygen that would provide the wearer with up to four minutes per candle of extra operating time.

Over the years, the Chemox Breathing Apparatus has proven to be a reliable piece of life safety equipment. Nonetheless, it has had to survive more than its share of controversy. For example, in the early sixties' there was an Unsatisfactory Condition Report (UCR) raised at the fire school concerning the reliability of the equipment. This UCR action was triggered because of an accident involving a student.

The student had started to climb a forty-foot ladder wearing a Chemox mask, when he somehow ran out of breathable air and fell to the ground unconscious. Fortunately, he sustained only minor injuries, but the ensuing alarm over the incident prompted the UCR action. This action effectively postponed further breathing apparatus evolutions in the tower for several weeks, causing some firefighter graduates to have to return at a later date to complete their training. Despite this incident and the on-going difficulties many firefighters experienced using the Chemox, it continued to endure as an effective piece of life safety equipment.

Individual concerns did persist however, for many years over the units reliability, these concerns as a rule were motivated either by a lack of training or an individuals misunderstanding of the equipment's operating limitations. Nevertheless, past controversy notwithstanding, the Chemox with very little modification remains in service today.

Foam(s) for Fire Fighting

Although there have been quantum leaps in fire extinguishing agents, foam still remains the primary weapon in the firefighter's arsenal, when fighting flammable liquid fires. The early sixties marked the advancement and improvement of foaming agents and their effectiveness to extinguish and provide a vapour seal in all manner of flammable liquid fires. Previously, some materials such as alcohol in large quantities did not have an effective extinguishing agent.

The primary foam used to combat aviation fires in the sixties was a protein based foaming agent. Protein type foams utilize aqueous liquid concentrates proportioned with water for their generation. Protein foam concentrate was inducted into the water stream using an in-line proportioned calibrated to a six percent mixture. An air-aspirating nozzle was required to allow sufficient air into the mixture to produce a foam with an expansion ratio sufficient to blanket a large area. Later air blowers would be used on crash vehicles, which improved the quality and expansion ratio of the foam and even its appearance.

Protein foam concentrates produce dense, viscous foams of high stability, high heat resistance and good resistance to burnback. They are nontoxic and biodegradable. A fact not lost on firefighters who discovered the excellent fertilizer qualities of this product when cautiously spread on the lawn or garden!

Combining the potential of protein foam and dry chemical fire extinguishing agents should have proved to be a firefighters dream, however, it initially caused exasperating problems for the

firefighter. It seems that simultaneous use of foam and dry chemical caused the foam blanket to break down. Apparently, the problem lay in the chemical composition of the dry chemical which proved incompatible with the foam. In effect the sodium bicarbonate powder destroyed the foam bubble and eventually the foams vapour sealing qualities. This chemical reaction effectively curtailed the combined use of these two agents for a period of time, through research, and the collective efforts of the Ansul Company and the United States Naval Research Laboratories, the problem was eventually solved. They had succeeded in producing a dry chemical agent that used potassium bicarbonate, known as Purple K as a base, a product that exhibited total compatibility when used with foam.

The development of Aqueous Film Forming Foaming Agents (AFFF) by the 3M company, further improved the fire knockdown capability and the fire suppression qualities of foam. The air foams generated from AFFF solutions possess low viscosity, have fast spreading and levelling characteristics, and, like other foams, act as surface barriers to exclude air and halt vaporization. It's tremendous knockdown capability permitted retention of dry chemical reserves for use on special fire situations, such as three-dimensional fires. Clearly a superior foam agent, AFFF replaced protein foam as the main hydrocarbon fire fighting agent. Delivery of the 1972 Oshkosh 3800 litre crash truck effectively precluded further use of protein foam. However, the Fire School continued to use protein foam for some time after the introduction of AFFF. Besides using up surpluses of old foam, instructors claimed that the extraordinary extinguishing power of AFFF foam diminished the training value of exercises by making training fire extinguishment too easy for the students!

Fire fighting foams are usually defined by their expansion ratio, which is the ratio of final foam volume compared to the original foam solution before adding air. They are arbitrarily subdivided into three ranges: (1) Low Expansion Foam-expansion, up to 20-1; (2) Medium Expansion Foam-expansion, 20 to 200:1; and (3) High Expansion Foam-expansion, 200 to 1,000:1 (NFPA handbook). Included in the firefighters arsenal of foaming agents are: Aqueous Film Forming Foam (AFFF), Floroprotien (FP), Film Forming Floroprotien Agents (FFFP),and Alcohol Type Foaming agents (AR) to mention a few. AFFF and Medium Expansion foams are the two most widely used by the Canadian Forces. Note: With delivery of the new 1993 pumpers Class `A' foam agent will come into general use.

Fire Fighting Vehicles

Outdated and rapidly heading toward obsolescence, the venerable G15 was still being used as a front line vehicle in the early 1950's. Adoption by DND of the NFPA's Standard 403, gave the RCAF Fire Marshal the ammunition he needed to petition for new fire vehicles. The 403 Standard contained the minimum requirements for aircraft rescue and fire fighting services at airports. It would also designate a numbered category to indicate the type of fire vehicle, its fire fighting capacity and other equipment needed to sustain the airfield's category. The category an individual airport received was based on the largest aircraft scheduled to operate out of the

airport. RCAF Stations were initially given one of three categories, progressively, five, six or seven, category seven required the highest level of fire protection. Provision of a identifiable numbered category enabled the respective fire marshal responsible to have a yardstick for allotting personnel and equipment with something resembling continuity. Armed with the 403 Standard, the Fire Marshal made a presentation at Air Force Headquarters in Ottawa, for a new major foam vehicle to replace the G15. His pleas were not in vain and a new vehicle was eventually ordered. The solution to the G15 dilemma was the arrival of the G21, major foam vehicle. Built by FWD and LaFrance Fire Engine Company, it represented a significant step forward in crash vehicle technology. It incorporated a swivel, roof mounted dual- stream turret, with two one inch hard rubber hose reels on each side of the truck. Hose line nozzles allowed the operator to select either fog mode or straight-stream. Water tank capacity was 500 gallons and the foam tank held 70 gallons of six percent protein foam liquid concentrate. Using the turret, the truck delivered 500 gpm of foam at 200 psi. The effective range using straight stream was 85 feet, 25 feet when the turret was used in the fog/fan mode. Rockwood USA designed the foam pumping system.

MAJOR FOAM FIRE FIGHTING VEHICLE'S

G23 MFV

The G21 served the fire service for a relatively short time (five years) before it was replaced with the G23. As a front line vehicle the G23 gave the fire departments a reasonably effective flammable liquid fire fighting vehicle. Before the acquisition of the G19 MFV the G23 was the primary crash fire fighting vehicle. The vehicle's fire fighting package included; a 500 gpm centrifugal pump directly coupled to a 163 hp gasoline engine, a five hundred gallon water tank and a 70 gallon foam tank, a roof mounted turret, two ground sweep nozzles under the front bumper, two one inch handlines mounted on reels on each side of the vehicle complete with three position nozzles and two under truck nozzles to protect the underside of the vehicle. The agent of choice was protein foam, and although the foam did not have the same rich white appearance of later protein foams it nevertheless was very effective in the hands of a skilled operator.

The truck was highly manoeuvrable on hard surfaces, but unfortunately lacked a legitimate off road capability. The turret operator stood on the outside the vehicle and communicated to the driver through a two-way radio. His position was one of good advantage and excellent all-round visibility. The pump/turret operator had complete control of the pump engine and foam delivery system. The turret operator used a governor controlled air switch to bring the pump engine (A Chrysler 24A industrial V-Type, eight cylinder, gasoline engine) up to speed and pump pressure to pre-set values. With features such as, duel type turret (fog and straight stream) and easily deployed handlines, allowed this vehicle to remain in service until the early 1970's.

In a secondary role, this vehicle could also be used for fighting structural fires. The technique involved closing the valve between the pump discharge and foam proportioned water, straight water could then be used through the turret and hand lines. Water could also be taken on using

soft suction techniques, through a pair of 22" ports. However, there was no provision to draft water from a static source.

Driving the G23 could be a traumatic experience. With ten gears in low range and a further ten in high range this was not the vehicle for the timid or uncoordinated. Many a strident rhapsody was heard coming from this vehicles gear box when an inexperienced operator sped to an emergency. Overall a good solid vehicle that was seriously under rated by some, but proved its worth to those who took the time to know it well. The most serious drawbacks to the vehicle's performance were its modest water carrying capacity, low foam expansion ratio and limited off-road capability.

Three more crash trucks would be built that used protein foam, although these vehicles incorporated variants in the foam development and delivery systems. They were the G19, G21 and the Sicard MFV's.

G19 MFV

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The Alvis G19 MFV was manufactured in England by the Pyrene Foam Company. It was mounted on a 6 X 6 all-wheel drive Salamander chassis, which previously had been designed for use as an armoured personnel carrier. A Rolls Royce B81, Mk 80A provided road and pump power with use of a power-take-off system (later changed for a V8 Ford engine and Allison transmission). The fire fighting package included a 700 gallon water tank and 110 gallon foam agent tank capacity. All controls for operation of the foam producing equipment were located in the cab and delivery valves to handlines and turret could be operated from the driver's seat.

Its cross country ability was remarkable and it would come very close to being the much sought after all-terrain fire vehicle. One of the unique features of this vehicle (there were several) was the position of the drivers seat, it was located dead centre in the cab. The truck's active life was relatively short for the design of the fire fighting package provided more payload than the chassis was meant to carry. As a result, the vehicle became beset with mechanical problems and quickly earned the title of Hangar Queen. The title was not totally deserved, but the combination of overloading and the unforgiving (initially) installed pre-selection gear box (especially to inexperienced drivers) sounded the vehicle's death-knell. The vehicle's design was basically sound and its cross country, off-road performance would be enviable even today. The vehicles off road capability was lost to future generations of crash vehicles, which is something of a shame given that it has never been matched by newer designs.

One of the G19 strengths that was not overlooked, was the foam production system. The system incorporated an 800 cubic foot-per-minute air blower that allowed the truck to generate superior foam with an increased expansion ratio. The turret was exceptional, with an effective reach of stream of over 100 feet. During periods when it was serviceable it was an unmatched first-class piece of fire fighting equipment. However, the four-inch hand-lines did become extremely heavy

when charged with foam. A real test of strength was to manoeuvre charged lines without developing a hernia.

G21 MFV

Also manufactured in England was the Thornycroft G21, crash truck. It was specifically built to operate in the crash protection role and saw service only on NATO airfields in Europe. Every Canadian airfield in England, France and Germany took delivery in the mid-fifties of at least one of these vehicles. The G21 had two unique features, the driver's position was located on the right side of the vehicle (probably in deference to its English origins). The drivers had to change gears with their left hand, a switch that did not take too long to master. Perhaps more of a challenge faced firefighters stationed in England, had were obliged to drive on the left-hand side of the road and this feat generally took a little longer to master.

Pump controls and the turret operator's position were located at the back of the truck on an open platform. The turrets rear facing position required a change of tactics by the driver/firefighters, who were used to a forward facing turret, with a straight forward head-on approach to an accident scene. Driver's of the G21 had to cope with a `swing away' approach tactic that left the vehicle facing away from the incident. Considerable judgement on the part of the driver was required to arrive at the scene of the incident facing the opposite way and yet within effective range of the turret! Introduced in 1953, the G21 was not replaced until 1964.

Sicard MFV

The Sicard crash vehicle was manufactured in Montreal for the RCAF, in 1964. It had a Pyrene foam generating system that used an air blower to achieve a 14 to 1 expansion ratio. The foam producing agent used was a six percent protein solution, to produce a very high quality foam. Protein foam effectiveness relied on the optimum injection of air to enhance the qualities of cohesion, adhesion and its ability to flow freely. The foam producing system on the Sicard maximized these desired characteristics. Turret range was in the neighbourhood of 120 feet maximum and its optimum range could be varied at the discretion of the operator, to 35 feet by using a fan mode of operation. The vehicle also came equipped with the four-inch hernia producing handlines, thoughtfully stored on each side of the vehicle. Originally powered by a Rolls Royce engine the engine compartment was later modified to accommodate a V8 Ford power plant.

E62 Flusher

There was another vehicle that the Fire Chief had in his fire fighting arsenal, the E62 Flusher. As the name suggests, this vehicle's primary role was to clean streets, ramps and other hard surfaces. However, some far-sighted individual decided to equip the E62 with foam-making capabilities, making it a very versatile auxiliary fire vehicle.

A number of aircraft emergencies (mostly wheels-up landings or aircraft with defective nose gear) had occurred at flying stations in Canadian and Allied Airfields. Foam paths using vehicles similar to the E62 had been laid prior to the aircraft landing with good results. The successes had allowed the practice of laying runway foam paths to become a recognized method of dealing with a certain types of aircraft emergencies. The initiation of a request to foam a runway always came from a flight operational source, invariably from the aircraft commander.

The E62 could lay a foam path nine feet wide, 2000 feet long, two inches deep at a speed of four to five miles per hour. There appeared to be at least four possible benefits to be gained from foaming a runway:

a. Reduction to the extent of aircraft damage;

b. Reduction in decelerating forces;

c. Reduction of friction spark hazards; and

d. Reduction in fuel spill hazards.

Analysis of the theoretical benefits of foaming runways remained inconclusive however, the practice had its full share of proponents and detractors. Nevertheless, with the introduction of Aqueous Film-foaming type (AFFF) type foam, the practice ceased.

Despite the loss of its runway foaming role the E62 continued to provide the firefighter with an important fire fighting asset. It could readily be used to supply water to nurse crash vehicles or employ its 2000 gallon water tank to contribute to fire department operations in outlying areas.

CODE 143112 Twin Agent CFR Fire Fighting Truck

Produced by the Pyrene Manufacturing Company to meet the Canadian Forces' operational requirement to provide a self-contained airlift fire fighting package for the provision of crash protection for the Helicopter Squadrons at bases such as CFB Petawawa.

The chassis was an International Harvester Model 1700 Loadstar series with 4-wheel drive and an automatic transmission for ease of driver operation.

The airlift fire fighting package consisted of a light weight twinned ball unit containing 400lbs of potassium bicarbonate dry chemical and 50 gallons of light water (6 percent concentrate). The dry chemical and light water are expelled by pressurized nitrogen cylinders through twin hoses to a dual nozzle assembly.

The unit was rated to be able to extinguish and securing a flammable liquid fires in depth up to 2,000 square feet in area. The prototype was delivered to CFB Petawawa during the month of January 1969.

NUMBER ONE AIR DIVISION

In October 1951,the first unit (410 Squadron) of the RCAF left Canada aboard the aircraft carrier HMCS Magnificent to begin the fulfilment of the Canadian air commitment to NATO. Within two years, the Magnificent's voyage four Canadian Fighter Wings had been established in Europe.

Location and Composition of the Air Division

1 Air Division Headquarters, located at Metz, France was the administration and operational centre for all four fighter wings.

Located at Marville, France, was 1 Fighter Wing. It was initially composed of squadrons 410, 439 and 441. 1(F) Wing was originally located at North Luffenham, Rutland, England. In the Spring of 1955 it moved to France.

Located in Gros-Tenquin, France was 2 Fighter Wing. Originally the Wing included squadrons 416, 421 and 430.

Located at Zweibrucken, Germany was 3 Fighter Wing. It originally was formed of squadrons 413, 427 and 430.

Located at Baden-Soellingen, Germany, 4 Fighter Wing included Nos.414, 422and 444 Squadrons.

Established at Langar, England 30 Air Material Base. It was responsible for supplying material to the four wings. 137 Transport Squadron at Langar flew the supplies to stations on the continent.

With its deployed Air Division in France and Germany and its Army Brigade Group located in Northern Germany, Canada provided a significant military presence within the NATO organization.

Naturally, all of these European installations needed first rate fire protection and generated a new demand for trained firefighters. Many ex-RAF fir fighters were recruited through the office of the Canadian Joint Staff (CJS) located in London, England. They were inducted into the RCAF as trained fire fighters, or awarded provisional trade qualification groupings.

Although much of the fire fighting equipment would be sent from Canada, there was still extensive training required for fire fighters arriving from Canada. The training was necessary because considerable quantities of equipment and vehicles, particularly fire vehicles, had been purchased in Europe and had unusual operating controls. The close proximity to a potential

enemy also required a change in the way fire fighting operations would be carried out. There was the necessity to carry small arms and respirators in addition to the `normal' fire fighting equipment, when exercises were in progress. The frustration of carrying weapons and operating fire equipment became a real source of frustration. However, that was an unavoidable fact of military life in Europe. The whole tactical and strategic picture differed greatly from the armed forces posture in Canada, adopting a far more operationally ready attitude.

In addition to expanding established manpower ceilings, the deployment of forces to Europe gave a renewed sense of purpose to the Canadian military. The heightened sense of purpose was further intensified by the constant air training operations being flown by the squadrons. These activities impacted on all facets of station life, with the fire department being no exception. Numerous crash alarm responses became the norm for the fire fighters based in Europe.

The policy of the time was to train as many aircrew as possible, accordingly, short term commissions became the rule for most fighter pilots. This strategy meant that the majority of pilots would typically be released after five years of service. The intent of the program was to make available a pool of highly trained pilots in case of war. Politically the concept had merit, for the air force it meant the continual training of raw pilots. Inexperienced pilots and high speed aircraft translated into frequent airfield emergency responses.

The Fire Marshal Visits

Housed in the 1 Air Div HQs at Metz, the Fire Marshal's office was administered by a flight lieutenant, and his assistant, a warrant officer. There was also a fire hall located at the headquarters, an independent operation, staffed by a sergeant and ten fire fighters.

The fire hall housed a Bickle Seagrave pumper which faced an extremely steep hill immediately as it exited, there are no reports of its failure to make it up the hill even in icy conditions but, according to some of the fire fighters it really made life interesting in winter. The lack of fire responses at the headquarters complex may account for the following unsubstantiated story. It seems that during an official visit, to the headquarters fire hall, the Fire Marshal became somewhat disenchanted with the standard of cleanliness of the hall, and fire apparatus. He proceeded to let the fire chief know of his displeasure in no uncertain terms. In fact, he was so annoyed by the situation that he surreptitiously wrote his initials in the dust on the pumper! Weeks later, he returned on an apparently unscheduled visit only to find his initials still gracing the dust on the pumper! The fallout of this return visit is not known.

Each wing fire department was initially headed by a warrant officer second class (WO2), his Deputy was a fight sergeant and the crew chiefs sergeants. The fire vehicle fleet was composed of a Bickle Seagrave G11 Pumper, a G21 Thornycroft Major Foam Vehicle, and an International G13 Dry Chemical truck.

Air Division Activities

The wings of 1 Air Div witnessed many aircraft crashes which would test the mettle of the individual fire fighter. The following excerpts from the wings activities will help establish the flavour of life in the Air Div.

Marville 1 (F) Wing was the site of two disastrous crashes involving Bristol Freighter aircraft. These aircraft were widely used during the early years of wing activities to ferry cargo and passengers. The crashes accounted for considerable loss of life, but one in particular had an interesting footnote. Air Div Fire Marshal, Flight Lieutenant Graham, had the misfortune to be a passenger on the first one to crash. The aircraft flew into a heavily treed mountain in heavy fog. Graham was lucky to survive the accident sustaining a broken ankle and minor abrasions. He scrambled out of the wreckage and began assisting other survivors to drag the dead and injured from the ensuing fire. Later, he hobbled out of the woods on an extremely painful ankle to a French village several kilometres from the crash site, where he was able to report the location of the downed aircraft.

Yet another notable incident occurred on 10 July 1956, when a fire occurred when a shipment of aviation fuel was being unloaded at Montmedy, France, a NATO fuel dump near 1 Fighter Wing. Sergeant D. Stevenson a 30-year-old RCAF fire fighter from Montreal, was honoured for his efforts in quelling it. He was awarded the George Medal one of the Commonwealth's highest gallantry awards bestowed in peace time. The Citation for the award of the George Medal reads as follows: "On 10 July 1956, a fire occurred in a shipment of aviation fuel being unloaded at Montmedy, France. Sergeant Stevenson who was acting as Deputy Fire Chief, performed two acts of bravery which enabled the fire section to bring the fire under control and finally extinguish it. On the first occasion, he climbed to the top of a sealed tank car which was in danger of exploding because of extreme heat and, after repeated efforts, managed to release the manhole cover lock. This relieved the pressure building up inside the tank car and prevented an explosion which would have made this fire completely uncontrollable. Later, while the fire was being kept under control but could not be extinguished, Sergeant Stevenson, protected by only a heat mask and a stream of water played on him by other fire fighters, again proceeded to the top of the blazing fuel tender and successfully introduced a foam line through the manhole cover, and thus brought the fire under control. Both these acts of bravery were carried out with the full knowledge of their necessity and of the dangers involved. The courage and unselfishness displayed by Sergeant Stevenson and the complete disregard for his own personal safety on this occasion was in the highest traditions of the Royal Canadian Air Force."

Sergeant Stevenson, was personally awarded the George Medal by Her Majesty Queen Elizabeth at an investiture at Government House, Ottawa, on Dominion Day, 1 July 1959.

Grostonquin, France was home to 2 (F) Wing, and the Red Arrows aerobatic team. The Arrows were a popular attraction at air shows around Europe, not unlike today's Snow Birds. During a routine practice formation flying exercise over the airfield, a miscalculation occurred that sent four of the aircraft (Mk 6 Sabres) into the ground, one aircraft striking the station hospital. Casualties were high and property damage severe-the fire fighters again earned their keep!

An interesting experiment was tried at 3 (F) Wing Zweibrucken. Inspired by Squadron Leader Ernie MacLaren and with the cooperation of Fire Chief Flight Lieutenant J.Cowell, the station photo section mounted a movie camera on top of the major foam vehicle. The idea was to have the fire crew responding to an airfield emergency, film the incident and surrounding activity. Aircraft accident investigation teams would then be able to review the movie at their convenience. After overcoming some initial teething problems, the experiment proved to be successful. It supplied the necessary photographic evidence to exonerate a pilot accused of an inappropriate emergency landing procedure. Before the film was reviewed, the pilot faced the real possibility of being court marshalled. The movie taken from the top of the crash vehicle clearly showed the accused pilot was not in error. Notwithstanding, its immediate success, for some unexplained reasons the project was abandoned.

The RCAF base at Langar, (30 AMB) served as the European terminus for trans Atlantic flights by North Star and also had the venerable Bristol Freighters on inventory.

During 1955-58 the A.V. Roe aircraft company was housing and test flying the Vulcan bomber at the same airport. The RCAF fire department provided the crash rescue services for them. The test aircraft were painted all white, which combined with its revolutionary delta wing, caused them to be quite an awe inspiring sight. This was particularly so when the aircraft made its final approach on landing which normally was accomplished with a pronounced nose high attitude.

It was at this location on the 17 December 1955 that a major fire occurred on the civilian side of the airport that, as it later turned out, brought considerable recognition to the Canadian military fire department. The fire was in an aircraft maintenance hangar which held many 45 gallon drums and other sized containers of paint solvents, thinners and the like, as well as Shakelton bombers which substituted for maritime patrol aircraft. The RCAF fire department was the "first-in" department and remained the sole department involved for an extended period. Although there was extensive damage, which included one of the Shakelton aircraft, other aircraft and miscellaneous contents and the structure were saved.

Nottinghamshire authorities took the view that the operation was highly successful. As a consequence the Nottinghamshire County Fire Service presented the RCAF fire department with a Certificate of Meritorious Conduct. Each member of the crew that was involved in the fire fighting operation received a signed copy of the Certificate. (personal memoirs Lieutenant Colonel Lorne MacLean ex CFFM).

FIRE FIGHTING IN THE NUCLEAR ERA

In the late 1950's a important decision by Prime Minister John Diefenbaker's government that allowed an extension of Canada's defence by including nuclear war heads in its arsenal. The actual war heads would remain under United States safe keeping-until an out break of hostilities occurred or was imminent. Canadian Armed Forces would provide support, infrastructure and

training in their use. The weapons were solely intended for use in defence of North America. Position on Canadian soil were two types of nuclear warhead, one intended for use in the Boeing IM-99B Bomarc surface-to-air missile the other an Air-2A air-to-air type weapon for use with the CF 101 Voodoo interceptors. The Bomarc sites were located at La Macaza, Que, (447 Squadron) and North Bay, Ont, (446 Squadron). The stations earmarked for housing CF 101 missiles were RCAF Station Comox, BC, and RCAF Station Bagotville, and a section of four aircraft were kept on site at Val d'Or Que. A deployment squadron capable of using the weapons would fly out of RCAF Station Chatham, NB.

Effects on Firefighters

Nuclear weapons had a profound effect on fire fighter operations once Canada accepted delivery of these weapons. The effects proved to be profound and far reaching. Security clearances had to be upgraded, emergency response tactics changed and controlling fires with nuclear involvement needed to be practised. In addition, substantial increases were required in both personnel and equipment. The increases in fire department personnel and responsibilities, would usher in changes in fire department rank structure. All nuclear capable airfields were now to be commanded by commissioned officers. In the past these departments had been headed by Warrant Officers. The exception was the Bomarc squadrons who did not upgrade their chief's positions until much later, when they changed from sergeant's to flight sergeants.

Construction of special armament storage facilities were required at every nuclear capable unit. Warheads used in Bomarc missiles were secured in the nose of the actual missile. Additionally every silo had motion and intrusion alarm's installed. Storage of air-to-air weapons required reinforced concrete structures called Igloo's to ensure their safe storage. Constant patrols by armed military police became the order of the day. High security measures meticulously maintained around these weapons had a direct impact on the conduct of fire responses to the respective weapons area. There was no such thing as speeding into one of these sites without an appropriate invitation, to do so would have meant a one-sided confrontation with the armed guards!

To the firefighter employed at these nuclear capable sites the learning process was complicated, involving continuous testing by section, station and outside agencies. Firefighters employed at nuclear capable sites, had to have a security clearance classification to at least secret, demonstrate an ability to pass the required written nuclear safety test at set intervals, master new tactics in order to successfully fight fires with high explosives complications and become comfortable with all the jargon concerning security and safety procedures identified with nuclear warheads. Terms such as, Broken Arrow, Bent Spear, No Lone Zone and a virtual myriad of closely guarded esoteric idiom now entered the firefighters vocabulary. For the senior members of the department attendance at an On-Scene Commander's Course was mandatory. Successful completion from this course enabled graduates to take control of a nuclear accident site. When carrying out on-scene control duties they became the commander's eyes on-the-scene. Close contact by radio and constant updated situation reports (sitreps) to the command post became of paramount importance. Shouldering the responsibility of the position of OSCAR was a true test

of an individuals's grasp of intricacies of command and control. Adopting the OSCAR title meant accepting a myriad of responsibilities including: co-ordination of all on-site response agencies, personnel, equipment and ensuring the transmission of any pertinent information to a command post. Not to mention putting out the fire! To be accurate, the fire chief typically was only expected to handle the OSCAR role until the fire was extinguished. He would then hand over control to a designated OSCAR, usually an air traffic control officer.

Fire Fighting and the Nuclear Hazard Considerations

Techniques used for fighting fires involving nuclear weapons are fundamentally the same as those used in combatting explosives fires, with added radiological hazards. That's how armament experts glibly described the hazards to the fire fighters. The nonchalant, off-hand way this gem of information was given left the individual with the impression that fighting explosive fires was not all that dangerous! Fire fighting efforts would usually concentrate on saving lives and if possible stabilizing the situation. Should the fire chief decide that the firefighters are unable to control the fire, he would declare a Broken Arrow and quickly sound the withdrawal signal using the fire vehicle's siren. They would then withdraw to a previously determined point at least 1200 feet upwind from the incident. Other base responders would retire to a withdrawal sector not less than 2000 feet distance from the scene. Small chunks of scattered high explosive material used in these weapons could be detonated by merely stepping on or kicking the material.

The anticipated scattering of explosive pieces presented a particularly dangerous hazard, given that there was sure to be foam extinguishant covering the ground that could perhaps disguise the explosive chunks. Fire fighting operations under conditions described, would have been extremely hazardous the only answer lay in development and constant practice of an intense training schedule. This approach was in fact instituted with out exception by every fire department with nuclear weapons responsibilities.

Air Division Involvement

There was an extraordinary amount of training, preparation and evaluations performed on every nuclear capable installation. Fire fighters would form an element of every exercise scenario, which effectively kept them in a constant state of readiness. To fail one of these all too frequent evaluations before a visiting inspection team, would mean severe repercussions for those responsible.

Two of the overseas wings also received nuclear weapons, No's 3 and 4 Wings respectively. Fire departments who were based on stations that received these weapons had their personnel strength doubled (in some cases tripled). Increases of this magnitude caused turmoil among the crews along with an remarkable growth in personnel administration for the individual fire chief's. The tactical weapons (nuclear) used in Europe, were an air-to-ground class. Intended delivery to the target(s) was via CF-104 Starfighter aircraft. Wing fire departments became subject to the same rigorous training drills and evaluations procedures as installations in Canada.

Demands for operational excellence made day-today activities much more strenuous for average fire fighter. The intensified training preparations and increased scope of operations surrounding the fire hall activity, had a positive far reaching effect on the individual fire fighter. The increase in training had transformed them into more proficient tradesmen.

The Nuclear Training Dividend

Fortunately for everyone, these highly honed nuclear fire fighting skills were never used on an actual incident. Quite apart from the actual damage the incident would have caused, the combat capability of the Canadian Forces and its allies would have been placed in jeopardy. The uncommon safety precautions and vigilance applied to the care, handling and maintenance of these weapons, paid big dividends for the Canadian Forces, which ended its association with nuclear weapons, without a single accident or incident of any gravity.

The 1960's were heady days for the RCAF, with a peacetime peak strength of 56,000 personnel and an inventory of more than 3000 aircraft. Unfortunately, this situation would not last for very long, the politicians were already thinking along more modest terms with regard to the future strength of the Royal Canadian Air Force.

THE CRASH OF AVRO ARROW 201

At 0951 hours on March 25th, 1958 Avro Arrow serial number 25201 took off from Malton airport in Toronto with Avro's Chief Experimental Test Pilot, Jan Zurakowski at the controls. This maiden flight which lasted just thirty-five minutes launched Canada and the Royal Canadian Air Force into the age of supersonic aircraft. Malton airport (now Pearson) was and for that matter still is, Canada's premier air passenger terminal. The majority of passenger aircraft using the airfield during the 1950's, were four engine piston and turbo-prop types. Aircraft such as Lockheed Constellations, Bristol Britannia's, and De Haviland Viscounts, were all considered large aircraft in those days.

The provision of aircraft rescue and fire fighting services for the test flights of the Avro Arrow was the responsibility of the Avro Aircraft Plant Fire Department. They had been supplied with a major foam vehicle (MFV) and a modified Jeep, by the Department of Transport for this purpose. However, with national and international spotlights fixed squarely on the Arrow's anticipated performance, the Honourable, George R. Pearkes V.C. decided that the crash protection for the Arrow's test program should be beefed up. This would be achieved by the temporary addition of an RCAF major foam vehicle and crew. A short time later a Alvis G19 MFV,complete with crew arrived at the airfield. The crew consisted of warrant officer Bill Bourne Fire Chief, sergeants, Brown and Stevenson, two corporal's and eight aircraftsmen firefighters. They would form two shifts that would provide additional crash protection for all Arrow test flights. The RCAF crash crew occupied the south west corner of a World War Two hanger and a lean-to that over looked the tarmac and runways.

The Avro firemen kept their MFV but decided to hand over the Jeep to the RCAF firefighters. Fitted with two fifty pound CO_2 cylinders, a hose reel, and an assortment of tools, the Jeep provided little fire fighting capability but it was equipped with a ground control radio used to shepherd the Alvis G19 when it proceeded onto the airfield. The fire school in Camp Borden, had provided the G19, consequently did not have the necessary radio frequencies for airfield use.

Whenever the Arrow was scheduled to fly the crew would suit-up and move the crash trucks out to positions close to the runways. Cessation of flying normally signalled the end of the firefighters work day.

Wednesday June, 11th 1958, Arrow 201 took-off at approximately 1400 hours making its 11th test flight, it would last just over one and a half hours. Sergeant D.Stevenson was driving the Jeep, (ambitiously referred to as a Light Rescue Vehicle), and had positioned the Jeep behind the AVRO `Follow Me' vehicle at a point midway down runway 32. From this position approximately in the centre the downwind button of runway 32 remained obscured by a small hill. The crew were watching 201 make his approach disappearing briefly below the hill and then reemerging further down the runway heading towards the jeep's position. Sensing something wrong with the aircrafts approach Stevenson pulled around the `Follow Me' vehicle just in time to see a large plume of dirt and debris trailing what looked like the Arrow's fuselage. The aircraft finished it's slide off the far side of the runway. Immediate, frenzied activity ensued, with rapid radio calls to alert the rest of the crew, and the Jeep driver flooring the accelerator and headed toward the aircraft at high speed.

As luck would have it, the crashed aircraft came to a rest off to the side of runway almost directly in front of the Jeep's position. The crew must have set a response time record, for they were at the scene within twenty seconds. The aircraft had lost it's undercarriage and was down on its belly. The right wing tip was only 18 to 24 inches off the ground enabling firefighters to leap on and reach the cockpit. The clamshell cockpit cover had been popped open and pilot Jan Zurakowski, who was standing facing away from the response crew when Sergeant Stevenson yelled "are you alright, sir?" he was startled to see help had already arrived. The pilot was shaken but unhurt and was assisted out of the cockpit by the response crew. They then secured (pinned) the Martin Baker ejection seat.

Some time later in an Officers Mess, the pilot was overheard relating the events of that incident. He confessed he was still completely baffled by the speed with which the crash crew arrived at his downed aircraft, " the Air Force Crash Crew just appeared out of nowhere" he said.

The accident was caused by a malfunction of the landing gear. The pilot had no prior indication of any problem until after he had touched down and found the aircraft swerving uncontrollably to the left. Yet when the crew arrived a scant twenty seconds or so this extraordinary pilot had managed to shut down the engines and switch off fuel and electronics, before the aircraft had come to a full stop! The crew were more than a little grateful because of the danger presented by the enormous air intakes located just aft of the cockpit.

This incident is an account of a fairly routine response but its interest lies in the fact it underscores the military firefighter's capability to provide first class assistance on short notice and because it involved the most controversial aircraft in Canadian history. As for the speed of the response, which was nothing short of miraculous perhaps the old real estate sales maxim describes it best, "location," location," location."

Prime Minister John Diefenbaker rose in parliament on February 20, 1959 and announced the cancellation of the Arrow. The Arrow's cancellation effectively eliminated any future design and development of major military aircraft in Canada.

TRAINING FOR STRATEGIC AIR COMMAND

One of the interesting projects carried out by the Fire School at Borden, was the training of civilians for employment at the Strategic Air Command (SAC) bases in Canada.

The USAF had established bases in Churchill, Frobisher and Resolute in order to service their KC97 in-flight refuelling tankers. The agreement arrived at through Canada US discussions would allow the USAF to fund the employment of civilians to supplement the RCAF and USAF firefighters. The RCAF Fire School at Borden, would provide a seven week aircraft crash rescue course for civilians recruited for this purpose.

The manning for the fire departments was unique. It employed a flight lieutenant RCAF Fire Chief, flight sergeant Deputy, Sergeant platoon chiefs two corporals and eight aircraftsmen firefighters. The USAF provided three firefighters per shift, along with the eleven civilians. The desired manning was established at twenty personnel for each crew, with RCAF and USAF personnel designated as vehicles operators.

Equipment included: One code 211A (USAF) twin turret crash truck that carried 1000 gals of water, two code 1010 single turret 500 gal capacity crash trucks one RCAF G19 and one G23 MFV's. There was also a USAF three quarter ton light rescue vehicle that came equipped with 20 gals of Chlorobromomethane (CBM) and a variety of first class cutting tools, rescue saws and APU's. By all accounts an extremely fast response vehicle in the right hands.

These far north airfields were extremely well equipped for fire fighting activities, necessary because of their total self dependency and the potential hazard from the KC97 fuel tankers.

In all, fifty six firefighters were trained at Camp Borden for employment at these northern outposts. The training requirement ended when the change in strategic policy made the operational role of bases redundant. Happily, most of the civilians were able to find employment with DND as firefighters, many accepting positions as firefighters on RADAR Stations. The whole project had lasted less than two years.(personal recollections Marcel Trudel Deputy Fire Chief CFS Gypsumville)

FIRE PROTECTION

Fire Protection in Cantilever Hangars

Cantilever aircraft hangers made their appearance in the early 1960's. They provided shelter for repair and maintenance of the Argus long range, aerial, submarine counter-weapon aircraft stationed at RCAF Greenwood and RCAF Summerside. In addition the same type of hanger was built at RCAF Trenton to accommodate six CC106 transport aircraft.

Each hangar covers five and three quarters acres of ground, is 568 feet long by 450 feet wide, and has two cantilever wings each 135 feet long. With a building of such massive proportions and housing millions of dollar of equipment, extraordinary fire protection systems would have to be installed.

The central part of these buildings contain office, workshop, stores, and has a completely self-contained standard wet pipe sprinkler system. In the hanger area proper there are 12 foam sprinkler systems- comprising a total of 1600 foam heads. The sprinkler systems are fed from a 16-inch underground water main and a 6-inch underground foam liquid main. Integral with the pump house is a two-compartment concrete reservoir of approximately one half million gallons (US) feeding into an 18-inch steel header. The heart of the system is are four 2,000 gallon-per-minute (US) fire pumps, any three of which can handle the full water demand.

It is to the fire marshal's credit that these hangars received the `state-of-the-art' fire protection system. However, it would be many years before the remainder of the aircraft hangars were retrofitted with sprinklers. Controversy still surrounds the installation of wet pipe sprinklers in aircraft hangars, although they prove some degree of protection to the building little if any is provided the aircraft within. The reduced effect of wet pipe sprinklers is somewhat off-set by the anticipated rapid response of the base's fire department.

Three Minutes to Live

In 1964, the making of the movie "Three Minutes to Live" began. This was a project originally proposed by Major Phil Brown while at Air Force Headquarters and actually began in Camp Borden shortly after he took command of the fire school. Flight Sergeant C. Brooks became the schedule arranger (filming could not interfere with training) and liaison to the National Film Board (NFB) who were the producers. They were assisted by a cameraman from the RCAF Photo Establishment.

The film was an extraordinary success. The following year it was awarded the plaque for the outstanding film in the occupational field by the National Safety Council Committee on Films for Safety. The production of this film underscored the requirement for films that dealt with the

miliary firefighter, reviewing the dearth of movies that deal with this matter maybe its time to revisit the subject.

Fire Prevention Enforcement

During the early 1960's enforcement of fire regulations played a highly visible role in fire prevention. An extract from the Air Force Fire Marshal Wing Commander B.Quinn's (CFFM 1958-1965) report on fire activities exemplifies the enforcement measures taken to reduce fire loss and increase fire safety awareness. In it he reported disciplinary action against fire safety offenders in 1963 included:

a. 3 personnel released;

b. 09 awards of detention;

c. 24 fines totalling $1,057.00;

d. 67 administrative deductions totalling $2,009.00; and

e. 34 minor awards of punishment.

Remember these reflect only the air force statistics, no doubt the other two services were every bit as strict however, there is no record to demonstrate this fact. Today of course the emphasis has changed from punishment to education to achieve the same objective. Although, it remains an interesting comparison of methods, i/e punishment versus education.

INTEGRATION/UNIFICATION?

Integration was carried into effect in 1964-1966 in what was a complete reorganization of the armed forces command structure. Without exception everyone in the navy, army and air force was deeply effected in some way. Particularly the Air Bosun's who had lost their only aircraft carrier and their primary seagoing role. The decision was taken to include them as part of the firefighter trade. They were sent to the firefighter school in Camp Borden to attend conversion courses which would provide the background necessary to function in a land based fire department. Generally they were a little unhappy with the position they found themselves, and air force firefighters felt something close to resentment toward their newly arrived colleagues. The army also added its own fire inspectors to the overall firefighter population. There were several occasions when army sergeants with only fire inspection experience worked in RCAF fire departments in a supervisory role. They were then taught the operational role of the firefighter by so-called subordinates, subordinates presumably with the credentials to be the person in charge. This part of the unification programme was not handled in the most tactful fashion and some resentment simmered long after the unification process had faded into history.

Personnel

When the Forces Integration Program took place the manpower establishment included approximately 2400 firefighters. Broken down by service there was as follows: 200 naval civilians; 500 army civilians, 300 RCAF civilians 1200 RCAF servicemen and approximately 50 army inspectors. The Air Bosuns were later added to this total. Training would now include civilians and servicemen sharing a common facility at the Camp Borden Fire School. (soon to become the Firefighter Training Company (FFTC)

As the course of integration progressed the firefighters of all three services began to train and work together. This was far from a smooth transition, often egos and old prejudices got in the way of mutually desirable co-operation, nonetheless, inevitably things began to improve and stabilize. Army officers and men attended fire prevention courses at CFB Borden's Fire School, that they had previously attended in the RCE School at Chilliwack. More and more frequently, courses became a mixture of all three services plus civilian students. Like it or not, we had become one `happy' family.

Professional Downgrading

Unification brought an unexpected blow to the military firefighter. A review of military trades was carried out which left firefighter trade downgraded to group 2 equivalency and Senior NCO's had lost their coveted group 4 status. Military firefighter morale hit an all time low. Major J. Torraville (later Lieutenant-Colonel and CFFM) carried the brunt of the negotiations with the higher authorities, to regain the trade's rightful status. Not-with-standing, some herculean efforts on the part of Major Torraville and others, it still took over two years to reestablish fire fighting as a technical trade.

Unified Rivalry

Unification also brought its share of confusion and inter-service rivalry to the new integrated Headquarters. The three services were vying for the newly created position of Canadian Forces Fire Marshal (CFFM). The Ex-Army Fire Marshal Lieutenant Colonel Lindsey-Brown was in charge of fire engineering, while the Ex-RCAF Fire Marshal Squadron Leader Walter (Wally) Sinclair was in charge of operations. The navy waited in the wings. The fire engineering section was headed by Mr Arme DeRoche and staffed by civilians. The operations section was made up of military (RCAF) Tech CE/FP officers.

After a brief term as Canadian Forces Fire Marshal, Lieutenant Colonel Lindsey retired and was succeeded by Commodore G. Ball.

Equipment

Combining the three fire services brought together a vast inventory of fire fighting equipment, both mobile and static. Mobile equipment that was familiar to one service would be foreign to another. Crash vehicles located on airfields for example, or range fire fighting vehicles and of course fire boats. Each came with its own unique design and operational demands.

One unfortunate common problem was the fact that much of the existing equipment was to a large degree worn out or badly in need of replacement. The majority of the pumpers were 20 years old, the fire boats approaching 24 years in operation and inadequate for their designated role. Major foam vehicles too, were fast approaching the end of their useful life.

There was a pressing need for the unified staff officers to quickly become familiar with the demands of each of the other two services, to avoid misunderstanding. For example the RCAF had long changed the brass nozzles for the lighter composite materials. However, these would not stand up in a salt air environment so, brass had to be retained for naval use. Many similar equipment problems arose in the years immediately following integration, patience and good will were in great demand.

Fire Fighting Philosophy

As the fire services in each arm of the forces developed, so did their methods of conducting business. The RCAF directed its fire fighting/ protection service by placing emphasis on rapid response to airfield emergencies as its number one priority. While retaining the capability to fight large structural fires. However, this was generally viewed as a last resort after fire engineering, enforcement and inspections had all failed.

In contrast the army philosophy tended to vary. The basic method of operation centred around the belief that establishment of a fire hall equated to fire fighting exclusively. They would remain in the confines of their respective fire hall's until called to extinguish a fire or deal with some other related emergency. Fire prevention was not ignored but inspections and follow up recommendations was considered a fire engineering task to be carried out under the auspices of the respective command fire marshal's. Therefore, the individual fire marshal spent many hours coming to terms with the problems (real and perceived) of each installation. Productive use of the on-site firefighters as inspectors was not maximized at that time.

For its part the navy seemed to have developed a system that operated somewhere in between the army and air forces approach. By concentrating its efforts on the seagoing and dockside commitments the navy managed to retain its unique approach to fire fighting services. The problem facing the new headquarters was how to take all three approaches and create a philosophy that would provide the greatest benefit to all.

Unified Training

The answer to the dilemma of producing a common method of doing business, came by way of centralized training at the Fire Fighting Training Company in Borden. The unification of the forces allowed the instructors to train students toward common aims and objectives. Although the process of combining a unified approach to fire protection philosophy would take many years, and would still be subject to the vagaries and prejudices of the on-site fire chief.

THE 1970'S UNTIL THE EARLY 1980'S

The 1970's brought a series of changes to the organizational structure it also began an era where the DND Fire Service found itself on the front line of technical advances in fire fighting techniques, materials and physical fitness training. During this exciting and progressive era, the individual fire fighter would realize levels in training, personal fitness, fire equipment acquisition and scope of operational activities that his early predecessors could not have imagined.

Fundamental Change

One of the fundamental changes that took place in the early 1970's was the change to the firefighters hours of work. Over the years the shifts had been the standard 24 hour on 24 hours off, until the evolution of the 56 hour week. The 56 hour week generally consisted of three day shifts, three night shifts, followed by three days off. The civilian firefighter union had successfully fought to bring the a 42 hour work week to all civilian departments within DND. Their success allowed the military firefighters to follow suit. There were some managerial and administrative ramifications required to change to a 42 hour week. One of the most significant changes was the decrease in the number of firefighters on each crew. Because it was necessary to form four vis three crews to accommodate the shorter hours, and given that there were no increases to the fire departments manning establishments, this resulted in fewer personnel per crew. This was a similar situation to the 1959 change from a 24 on/off, 84 hour week, where manpower levels were not increased to allow for the expanded number of shifts. The move to a 42 hour week although universally welcomed by the shift working firefighters, was received with mixed feelings by some senior managers who viewed the extended periods of off-duty time as a negative rather than a positive factor.

Elevation of Rank Structure

The military rank structure and crew identification terminology also underwent changes during the 1970's. Sergeant Crew Chiefs became Warrant Officer Platoon Chiefs, a rank increase that naturally affected firefighters positively, allowing greater scope for individuals to be promoted. Designating the rank of warrant officer for platoon chiefs positions came indirectly through the manning levels and corresponding ranks of nuclear capable bases and lobbying by fire officials at the Headquarters level. It finally became policy for fire halls with category 6 status and above, to rank platoons in a similar fashion.

The DND Fire Service was also on the leading edge of developing a physical fitness program for the individual fire fighter, now widely recognized as a mandatory requirement to become a firefighter. There is not a fire fighter of this era that does not associate the physical fitness program with senior fire protection officers becoming the programs primer proponents expending much energy promoting its development. Although this program met considerable resistance in many quarters finally, the standards were written and the program obtained general acceptance. These standards are set out in CFAO's, CPAO's, outlined in C-08-005-120/AG-000 section four, and defined in various fire department Standard Operating Procedures (SOP's).

Equipment and Innovation

The 1970`s bore witness to the introduction of the `NOMEX' suit, a piece of kit generally taken for granted by the post 1970, firefighter. The name `NOMEX' derived from the Dupont trade name they gave the fire resistive material. Resembling a aircrew coverall it marked a new consciousness of firefighter protection, DND was once again squarely in the forefront of fire equipment development. This invaluable piece of personal protective gear has evolved to the point where it is worn with pride by firefighters virtually unrestricted, even off duty. Although this was not always the case and the right to wear the suit out side of the confines of fire hall had to won by fire officers in the various headquarters.

The Forces Fire Service began using foam to fight structural class "A" fires at the end of 1970 early 1971, long before it was generally accepted as a method of fighting structural fires in other military or for that matter civilian departments. The DND Fire Service was in the vanguard of fire services who used medium expansion foam (MedEx) in fighting structural fires. The application of MedEx foam in basement fires was extremely effective, extinguishing the fire quickly while minimizing water damage. It was a method used by this writer many times on fires of varying size and severity. Occasionally, it saw application in multi-rise buildings, invariably with excellent results.

Providing the triple commination pumpers with an integral foam tank was another equipment innovation, this idea has been credited to Lieutenant Colonel Lorne MacLean who recognized its potential. The addition of a forty gallon foam tank increased the individual pumper's potential considerably, supplying the vehicle with a ready reserve of MedEx foam for structural fire fighting. It also permitted quicker application of foam to a fire situation and allowed the pumper crew the flexibility to successfully fight small flammable liquid fires, or vapour seal the surface of a dangerous fuel spill. This innovation has been adopted by many forward thinking city and municipal fire departments.

Notable Incidents

On the 28 of September, 1974 an incident occurred that is worthy of mention here, not that there were not other recordable incidents taking place, but in this case the personnel involved received special recognition. A fire occurred in a fuel farm in Courtaney, B.C. which the military fire department from Comox fought, in corporation with the City fire department. As a result of the CFB Comox fire Departments success in fighting this fire the Chief of the Defence Staff's Commendation was awarded to Major L. Maclean, Fire Chief of CFB Comox and Corporal D. Armstrong also of the CFB Comox Fire Department. The text of their Commendations (paraphrased) reads: "in recognition of the courage and professional ability displayed at the scene of a fuel fire at Courtenay , B.C. on the 28 September 1974. Their total disregard for their personal safety while carrying out the extremely dangerous task of stopping the flow of fuel from the tanks threatened by intense heat, an their application of expert knowledge in fighting the fire, averted a very near disaster." Throughout the years Canadian Forces Firefighters have

unselfishly given their services to the general public at large, wether in Canada or overseas. Accounts such as the foregoing perhaps best illustrate their dedication in this area.

Yet another incident that took place in 1974, underscored the versatility of the firefighter. It happened one night at CFB Cold Lake , a report was received that an aircraft was down somewhere over the Primrose Lake range. Master Corporal Clackson and Corporal Ed Neufeld were detailed to accompany the crew of the rescue helicopter in their search for the down aircraft. Shortly after the helicopter became airborne, the crew started to receive a signal from the downed pilot. Arriving over the signal area, the pilot found he could not land anywhere close because of the numerous trees surrounding the site. The plot turned to the two firefighters and asked which one of them was going to be lowered down on the cable hoist. Being the junior firefighter Corporal Neufeld was elected to try the hoist.

To the young Corporal the task held not a little significance. He had but a brief time to reflect on the situation, here it was late October in Northern Alberta, it was dark and Corporal Neufeld had never been in a helicopter before let alone about to be lowered on a cargo hoist not approved for human rescue. But, after the initial shock of the assignment he resign himself to doing what was part of the job at hand. Clad in his fire fighting bunker suit which is a heavy piece of clothing in its own right, the ensemble was completed with the standard knee-length rubber boots, he was gingerly lowered into the night. His immediate trauma after leaving the relatively safe confines of the helicopter was further enhanced by his discovery that he was being lowered into water of uncertain depth. Corporal Neufeld could not swim! He said later that "despite an heroic effort combined with a major rush of adrenalin, he could not climb back up the 3 inch cable." Fortunately, his feet hit solid ground before he became completely submerged. He was then able to get to the pilot who was some distance away and remove him to dry ground where he administered first aid. After dressing the pilots injured knee, he manoeuvred him into the sling ready to be hoisted into the hovering helicopter. With a sense of overwhelming relief Corporal Neufeld too, was finally hauled up and reunited with the helicopters interior. At this point the helicopter received a signal from yet another downed aircraft which the control tower confirmed, that there was another aircraft down in their immediate area. Again the pilot could not land the helicopter and Corporal Neufeld was obliged to make a second descent soaking wet into a cold October night, to perform a second rescue. Twelve months later Corporal Neufeld received the Air Command Commanders Commendation, for his actions that night.

The incidents described are mentioned for two reasons first, they typify the spirit of the military firefighter toward any task presented and second, it clearly illustrates the diversity of duties they are daily expected to perform. In the case of corporal Neufeld, there was obviously no training given on cable hoist rescue before he was called upon to perform this dangerous task. In fact the whole situation had a distinct element of near disaster, which fortunately did not occur. Curiously, it was not until 1991, after a frustrating uphill battle that Major Mauch the current Air Command Fire Marshal was finally able to convince authorities that there was a requirement for specialized training for this type of rescue procedure. Somewhat ironically, the people involved in much of the discussions over firefighter helicopter rescue training stridently denied for a some time that the firefighters actually performed this kind of work. Eventually sanity prevailed and the training was initiated at CFB Cold Lake, and CFB Bagotville. The military fire fighter of the 1970's was required to diversify his talents in many non-traditional areas of endeavour. He

naturally was and is, able to make these adjustments as the particular situation dictated, which makes the firefighter a more valued member of the overall military team.

AIRCRAFT ARRESTING SYSTEMS

The operation of the aircraft arrestor equipment fell to the firefighter from the outset of its installation. This was a natural fallout because an aircraft that engaged the cable was usually in some kind of trouble and therefore the focus of the firefighters attention in any case. Also, the fact that the fire department would normally be first on the scene and had the manpower, equipment and aircraft familiarity to deal appropriately with the situation made the fire department response and arrestor gear operations inseparable. The first arrestor system inherited by the fire department was the linear hydraulic. This system (still used) incorporated tubes buried underground parallel to the runway. It functioned through the principle of hydraulic resistance generated by the engaged pendant cable pulling cable mounted devices (tapered circular wedges) through the water filled tubes. This system required a long time to reset (about 20-30 minutes) and was subject to freezing during winter months. With 3000 feet of nylon rope (1500 per side) set in boxes arranged to run out smoothly and at high speed the linear hydraulic arrestor barrier was the most labour intensive system firefighters would encounter. It was always a challenge to get the gear reset before the next aircraft in was on final. Other systems the firefighter had to learn to operate were the rotary hydraulic which used a retarder mechanism filled with liquid (usually a water/glycol mixture) which used to slow and eventually stop the aircraft. The greater the impact (based on weight and speed), the greater the generated retarding force applied, as the aircrafts speed decreased so did the retarding affect. The rotary friction system employed a friction brake and proved to be a very efficient easy to operate piece of equipment. Chain barriers were also used, generally to back up other primary systems. In effect it was a large pendant chain with links weighing between 18-40 kg (40 lbs). The stopping principle was the result of the aircraft engaging the pendant cable and a dragging motion applied the chain links. Clumsy and inefficient it was rarely used.

Operating the Arrestor gear had its inherent dangers for the unwary firefighter. There was cable tension which made the area within the V of the cable and immediately outside a very dangerous place until the tension could be released. Aircraft exhaust and intakes presented a significant hazard in their own right and the individuals involved in removing aircrew or disengaging the cable had to maintain a set distance from these areas. Aircraft that engaged the arrestor cable would occasionally be found to be carrying weapons, a hazard of great potential to the responding crew. Of course there was the aircraft itself which provided the additional hazards to the crew with ejection seats and the possibility of overheated wheels and tires a response to an aircraft engaging the arrestor system was a situation that could not be taken lightly. Only one Canadian firefighter to-date has lost his life during a arrestor recovery operation. That particular

incident occurred in CFB Goose Bay in 1990, the cause was cable tension that was suddenly, violently and fatally released.

The firefighter has also to deal with the mobile arrestor systems used mostly on fighter aircraft deployments in Canada's far north, or otherwise deployed to an airfield without an in-place arrestor system.

Deployable systems are generally of the rotary friction type. The hazards open to firefighters operating and resetting these portable systems are similar to those already described.

FUTURE FOCUS

The history and development of the Canadian Military Fire Service is one which has evolved through the untiring efforts of a great many highly dedicated and professional people. Their efforts have resulted in the creation of an organization which was recently acknowledged by the fire protection accrediting agency (University of Oklahoma), as one of the leading fire service in North America in terms of standards and qualifications. A tremendously impressive testimony to all those who have laboured so diligently to see the Canadian Forces Fire Service succeed.

The future however, will demand that firefighters training and equipment be modified in such a manner to permit them to deploy with combat units into all environments, air, sea, and land. The occupation will need to parcel it's skills and modify them in such a manner that they can be readily transported to operational theatres. Gone are the days when the firefighter trade could survive solely by providing fire protection to static bases and by sending a few off to sea. The armed forces has shifted its focus from developing and maintaining a defensive posture against the Soviet Union and its allies, to a role that is moving towards the development of rapid deployment forces. These forces will operate in support of multi-national operations such as UN peace keeping and disaster assistance operations. Such forces are being configured to deploy anywhere in the world and be self sufficient, even under the most austere conditions.

The changing role will continue to have a dramatic effect of the firefighter occupation. The number of fire fighters required at sea will increase over 50 percent by the year 2000. The air force needs firefighters to support air operations in deployed locations and the army has identified the need for firefighters in second-line brigade operations. The future health of the occupation is assured but the methods and tools used conduct its business must undergo significant changes.

The traditional skills and knowledge developed by the Fire Academy are by no means redundant. However, such skills will need to be modified in response to new challenges but most importantly, firefighters will need to internalize a totally new mind set. An understanding of their expanded operational role and increased military expectations must become part of their overall employment philosophy. Realization that their primary job is not only to protect domestic airfields and static bases but also to deploy with military forces regardless of when and where, on land and sea.

Needless to say, considerable training will be required not only to effect positively the capability and mind set of the individual firefighter, but also for the trade to survive the effort must be brought to the forefront as essential and not just desirable.

The future of the military fire fighter will be vested in his/her ability to become an integral member of a combat ships company. It will be vested in his/her ability to deploy, camouflage and defend a dispersed position and be vested in his/her ability to survive in a hostile environment and contribute to the battle effort by limiting Battle Commander's losses due to fire.

The fire fighter of the future must become much more cognizant of battle plan strategies and priorities. They will need to understand tactics to better advise senior staff on methods and means to mitigate losses due to fires and be prepared to function as key members of an engineer deployed team. Their inventory of skills will need to be expanded to permit them to assist in the construction of base camps, perform rudimentary repairs to their vehicles and equipment and assist with the rapid repair of essential services.

In summary, the challenges which lay before the military fire fighter are dramatic. The trade is one which has always demonstrated resourcefulness and a willingness to adapt. The future will demand no less.