
MEETING TYPE: Regular Council Meeting
MEETING DATE: Tuesday, September 06, 2022
AUTHOR: Darren Lee, Fire Chief
DEPARTMENT: Protective Services
ITEM TITLE: Self Contained Breathing Apparatus Compliance Upgrade
DESCRIPTION: Budget Amendment Request

QUESTION

How does Council wish to address Self-Contained Breathing Apparatus (SCBA) that are at and/or nearing end of life and unable to be upgraded to modern safety standards compliant with WorkSafe BC Regulations and National Fire Protection Association Standards.

OPTIONS

- A. THAT Staff be directed to the replace 50 SCBA with new units that are fully compliant with WorkSafe BC Regulations and National Fire Protection Association Standards at a total cost of \$650,000.
AND THAT the 2022 Financial Plan be amended to fund the additional amount required for the new SCBA units from a combination of 2022 Operating and 2022 Capital re-allocations, an additional \$306,000 sourced from the Fire Facilities and Equipment Reserve and \$200,000 from the COVID-19 Safe Restart Grant.
AND THAT Staff make an application to the Union of BC Municipalities Composite and Volunteer Fire Department Training and Equipment Fund for \$30,000.
AND THAT Staff develop a 20-year financial plan for the Lake Country Fire Department that includes future SCBA replacement purchases to be brought forward as part of the 2023 Financial Plan, updating funding to the Fire Facilities and Equipment Reserve as required.
- B. THAT Staff be directed to the replace 50 SCBA with new units that are fully compliant with WorkSafe BC Regulations and National Fire Protection Association Standards at a total cost of \$650,000.
AND THAT the 2022 Financial Plan be amended to fund the additional amount required for the new SCBA units from a combination of 2022 Operating and 2022 Capital re-allocations, and an additional \$476,000 sourced from the Fire Facilities and Equipment Reserve.
AND THAT Staff make an application to the Union of BC Municipalities Composite and Volunteer Fire Department Training and Equipment Fund for \$30,000.
AND THAT Staff develop a 20-year financial plan for the Lake Country Fire Department that includes future SCBA replacement purchases to be brought forward as part of the 2023 Financial Plan, updating funding to the Fire Facilities and Equipment Reserve as required.
- C. THAT Staff maintain Status Quo for 2022 and revise this proposal and bring it forward in the 2023 Financial Plan.

EXECUTIVE SUMMARY

All Self-Contained Breathing Apparatus (SCBA) manufactured to the 2002 Edition of National Fire Protection Association Standard (NFPA) 1981 Standard on Open-Circuit SCBA for Emergency Services will have NFPA approvals rescinded in 2022. This decision directly impacts 30 legacy SCBA and accessory pieces of equipment currently in-service with the Lake Country Fire Department (LCFD).

Staff thoroughly investigated options for legacy SCBA. Unfortunately, 30 legacy units are not able to be upgraded to modern safety standards. Staff also investigated options for upgrading 20 mid-life SCBA to ensure that they are fully compliant with the 2019 Edition of NFPA 1981. Staff found that the cost of retrofit for these 20 units was prohibitive and would unnecessarily add complexity to the LCFD Respiratory Protection Program.

The current District of Lake Country (District) 2015 to 2024 Capital Plan has identified funding for the incremental replacement of approximately 4 SCBA in each year of the capital and operating budget. Due to recent changes to NFPA 1981 and inflationary pressure increasing purchase price, this strategy is no longer viable. This procurement strategy has also added excessive complexity to the Respiratory Protection Program. This is evidenced by the fact that the LCFD currently operates 7 different models of SCBA within its inventory.

Staff is seeking approval to immediately replace 50 SCBA using a combination of capital and operating funds currently allocated in the 2022 budget as well as additional funds. If Option A is approved, Staff will need to access an additional \$306,000 from the Fire Facilities and Equipment Reserve and another \$200,000 from the COVID-19 Safe Restart Fund. This would allow the District to quickly react to changes in NFPA 1981 and make the best use of available provincial grant funding in the 2022 fiscal year.

KEY INFORMATION

SCBA is arguably the most critical piece of personal protective equipment utilized by firefighters today. There is a continual need to actively manage this essential life safety equipment to protect the health and safety of firefighters, maximize service life and comply with evolving industry standards while maintaining regulatory compliance.

Operating 7 models of SCBA adds excessive complexity to firefighting operations and training. This complexity increases the potential for SCBA misuse in firefighting conditions that are categorized as Immediately Dangerous to Life and Health (IDLH). If this were to occur, the outcome could be catastrophic. This variance in features also creates a situation where not all firefighters have equal and equitable access to the same modern safety features.

The District has a moral and legal obligation to protect its workers under WorkSafe BC Regulations. LCFD Senior Staff advocate for and, provide firefighters with personal protective equipment that is able to meet the threats faced while serving the community. This SCBA replacement is essential to meet those threats and maintain firefighter safety, while ensuring that DLC manages risk by complying with all legislative requirements.

DESIRED BENEFIT

LCFD's inventory and service records show the current fleet of SCBA have been incrementally purchased over the past 30 years. This procurement strategy is what led the LCFD to the current state of operating 7 models of SCBA within its current inventory. 30 of LCFD's legacy SCBA no longer meet the safety improvements made in the last two NFPA 1981 revision cycles (2013 Edition and 2019 Edition) and are not able to be upgraded. Another 20 of LCFD's mid-life SCBA would require significant retrofit and even afterwards they would still lack critical modern industrial hygiene features.

The significant safety improvements that started with the 2013 Edition of NFPA 1981 are as follows:

- New Universal Personal Alert Safety System (PASS) sound across all SCBA manufacturers
- New End-of-Service-Time Indicator (EOSTI) Low air alarm level activation (from 25% cylinder air remaining to 33% cylinder air remaining)
- Universal Emergency Breathing Safety System (UEBSS) across all SCBA manufacturers
- New Bluetooth voice communications requirements
- New water immersion requirements for electronic components

- New thermal insult requirements for face pieces and fabrics
- Increased pack visibility requirements for both reflective striping and photo luminescent material
- New Data logging requirements (initial activation pressure and at 30 second intervals, wearers breathing rate in L/min, 36 hours of data before being overwritten)

In addition to the significant safety improvements, the following industrial hygiene improvements were added in the 2019 Edition of NFPA 1981:

- New fabrics and new harness design that increases the effectiveness of post-use decontamination that significantly enhances the removal toxic and/or carcinogenic substances
- New second stage regulator design that increases the effectiveness of post-use cleaning and disinfection thereby reducing the risks associated with COVID 19 and other respiratory illnesses
- New second stage regulator design that increases the effectiveness of the regulator to face piece connection and reduces the chances of accidental disconnection and/or cross contamination

These changes represent significant positive impact on firefighter safety. The LCFD has 10 of these new SCBA currently in- service. These units do require minor retrofit to help the LCFD streamline from 7 models of SCBA down to 1 model of SCBA. By replacing 50 SCBA all LCFD firefighters operating out of the 3 LCFD Neighborhood Fire Stations, would all be equipped, and trained with the same model of SCBA that provides them universal access to modern safety and industrial hygiene features.

STRATEGIC RELEVANCE AND COMMUNITY SUSTAINABILITY

In addition to the safety enhancements included with modern SCBA detailed above. Modern SCBA are better suited for operations in larger buildings such as those associated with multi-family residential, commercial, and industrial occupancies. As the District grows, modern SCBA will support the firefighters who will provide fire services to larger buildings. This replacement is a strategic step towards ensuring that the LCFD has the right firefighting and personal protective equipment to service the community today, while strategically supporting growth planned in the District of Lake Country Official Community Plan.

Previously, SCBA replacement was managed on an incremental replacement schedule whereby a combination of operating & capital budget was allocated in every year of the 5-year financial plan. Due to the updated NFPA standards described above, as well as anticipated cost savings from buying in bulk, the purchasing schedule would now shift from purchasing a small quantity annually to bulk purchasing at planned intervals.

Rather than budget an annual number of expenditures for SCBA replacement, an annual amount would be contributed to the Fire Facilities and Equipment Reserve based on the long-term plan which would then be spent on future bulk purchases. The timing of these purchases would be based on industry standards and manufacturers recommendations.

REQUISITES

The purpose of NFPA 1981 is to establish minimum levels of protection for emergency services personnel from atmospheres that are categorized as IDLH. WorkSafe BC Part 31 (31.19) states:

“Firefighters who may be exposed to an oxygen deficient atmosphere or to harmful concentrations of air contaminants must wear a self-contained breathing apparatus of a positive pressure type having a rated minimum duration of 30 minutes. Parts 31.20-31.26 speak to the Fitness to use, Operation (Respirators must be used in accordance with [CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators](#), Clause 9.1)., Testing, Maintenance and Record keeping related to the overall respiratory protection program.

These standards apply to the design, manufacturing, and certification of new SCBA and replacement parts. NFPA 1981 is revised on a prescribed 5-year interval. This compliment of 50 new SCBA combined with the 10 upgraded modern SCBA currently in service, will ensure that a minimum of 1 SCBA and 1 spare carbon fiber air-cylinder (cylinder) for each firefighter on all applicable firefighting apparatus. Fire Investigators and Chief Officers will also be provided a minimum of 1 SCBA and 1 spare cylinder in their assigned command units. This distribution of SCBA is compliant with current WorkSafe BC Regulations and NFPA Standards.

UNINTENDED OUTCOMES

Purchasing 50 new SCBA combined with continued use of 10 modern SCBA already in-service with the LCFD, will allow the District to retire a significant number of legacy SCBA, who's condition is deteriorating. Many of these legacy SCBA were designed 30 years ago and have been in service with the LCFD for well over 20 years.

SCBA are used by firefighters under extremely hazardous and strenuous conditions. The wear and tear from firefighting and training is showing on these legacy and mid-life SCBA. In addition to the impact of physical, chemical, heat and moisture stressors, the age and associated reliability of integral electronics is an issue in and of itself. The risk of failure in older electronics escalates every year that they are in service. Retiring legacy and mid-life SCBA, will help mitigate exposure to escalating repair costs on depreciated assets that are at and/or nearing end of service life.

The availability of electronic parts is an emerging issue that will compound as the manufacturer phases out the production of legacy parts. The brand of modern SCBA currently in service with the LCFD has a limited lifetime warranty on all parts and electronic components. This warranty will protect the District for escalating maintenance and repair costs over the anticipated 15-year service life of these SCBA.

BACKGROUND/HISTORY

As stated previously, all SCBA manufactured to the 2002 Edition of NFPA 1981 Standard will have approvals rescinded by NFPA in 2022. This decision impacts 30 legacy SCBA, 20 mid-life SCBA and associated accessories currently in-service with the LCFD. Staff thoroughly investigated numerous options for legacy SCBA. Unfortunately, these units are not able to be upgraded to modern safety standards. Staff also investigated options for upgrading 20 mid-life SCBA to ensure that they are fully compliant with the 2019 Edition of NFPA 1981. Staff found that the cost of retrofit was prohibitive, not fully achievable and would add unnecessary complexity to the LCFD Respiratory Protection Program. To ensure that all SCBA are identical, LCFD will have to make minor upgrades to 10 modern SCBA and 2 RIT SCBA currently in service with the fire department. The cost of the proposed purchase of SCBA is detailed in the table below:

Option A and Option B

Component	Estimate Cost Per Component	Sub Total
50x SCBA & Harness	\$ 9,000	\$450,000
100x SCBA Cylinders	\$ 1,000	\$100,000
70x SCBA Face Pieces	\$ 500	\$30,000
3x RIT (Rescue) SCBA	\$ 3,500	\$10,500
10x SCBA Upgrades	\$ 2,200	\$ 22,000
2x RIT Upgrades	\$ 600	\$ 1,200
		Sub Total \$613,700
		Contingency \$36,300
		Estimated Total \$650,000

DISCUSSION/ANALYSIS

In support of its WorkSafe BC mandated Respiratory Protection Program, LCFD currently operates a compliment of approximately 60 SCBA and 120 cylinders as per the WorkSafe BC, Canadian Standards Association (CSA), and manufacturer recommendations. The current cylinder inventory is low due to a significant number reaching the end of their service life. A significant number of additional cylinders will reach end of life in the next several years. Cylinders require hydrostatic testing every 5-years and have a maximum service life of 15-years.

Based on operational needs and training demands the LCFD requires 180 cylinders. This replacement schedule is not set as of the date of this report, but Staff is confident that it can be harmonized with a planned capital replacement of SCBA (harness, mask, and carbon fiber breathing-air cylinders) every 15-years. This will halt incremental SCBA replacement and allow Staff to manage inventories towards bulk cylinder purchases every 5-years. The inventory of 100 cylinders that are included in this purchase will last the service life of the newly purchased SCBA. The advantage to DLC is that Staff will have the ability to clearly identify, budget for and reserve capital for all future cylinder replacement. The future target for supplemental cylinder will be set approximately 30 to 40 in 2028 (year-5) and an additional 30 to 40 in 2033 (year-10).

APPLICABLE LEGISLATION AND POLICIES

LCFD should strive to meet National Fire Protection Association Standards and industry best practices in all aspects of service delivery. The purpose of NFPA 1981 is to establish minimum levels of protection for emergency services personnel from atmospheres that are categorized as Immediately Dangerous to Life and Health (IDLH).

WorkSafe BC Part 31 (31.19) states:

“Firefighters who may be exposed to an oxygen deficient atmosphere or to harmful concentrations of air contaminants must wear a self-contained breathing apparatus of a positive pressure type having a rated minimum duration of 30 minutes. Parts 31.20-31.26 speak to the Fitness to use, Operation (Respirators must be used in accordance with [CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators](#), Clause 9.1), Testing, Maintenance and Record keeping related to the overall respiratory protection program.”

WorkSafe BC Part 31.25 states:

“(1) When self-contained breathing apparatus are used, the employer must ensure there are at least 4 apparatus available. (2) At least one spare compressed air cylinder, having a rated minimum duration of 30 minutes, must be maintained at full rated capacity and available for each self-contained breathing apparatus.”

IMPACT ON INFRASTRUCTURE OR MUNICIPAL SERVICES

Under Council’s direction, the District currently operates the LCFD as a ‘Full Service’ Fire Department as defined by the BC Office of the Fire Commissioner’s - Standard for Firefighter Training Competencies. Operating a modern compliment of NFPA compliant SCBA supports the current service level set by Council. Furthermore, the new Universal Emergency Breathing Safety System (UEBSS) and future option to add a Bluetooth Radio Direct Interface (RDI) will ensure interoperability with all Regional Mutual Aid Partners and future compatibility with the evolving Central Okanagan Regional Radio System.

As was mentioned above, modern SCBA are more reliable and are better suited for operations in larger buildings such as those associated with multi-family residential, commercial, and industrial occupancies. As the District grows, modern SCBA will support the firefighters who will provide fire services to larger buildings. This replacement is a strategic step towards ensuring that the LCFD has the right firefighting and personal protective equipment to supporting the growth planned in the District of Lake Country Official Community Plan over the next 15-years.

IMPACT ON STAFF CAPACITY AND FINANCIAL RESOURCES

The impact on staff capacity will be evident in the areas of firefighter training and asset management. In terms of training, moving to a uniform compliment of modern SCBA will streamline instruction, learning and evaluation. Streamlined training will help LCFD's instructors be more efficient and effective, as they will no longer have to demonstrate the differences between 7 SCBA models.

In terms of asset management, LCFD manages the cleanliness and condition of SCBA to ensure that they are properly maintained. This work reduces firefighter exposure to carcinogens created by the products of combustion. As part of this commitment, LCFD has several department members trained to the manufacturers 'Field Level Maintenance Standard' and will continue to access services from an authorized manufacturer's approved warranty and repair contractor. This two-tiered approach ensures that the LCFD has the knowledge, skills, and ability to safely clean and maintain its fleet of SCBA's. Outsourcing annual flow-testing and warranty repairs ensures that the LCFD's updated SCBA fleet will be properly maintained for maximum safety, reliability, and service life.

The financial implications will land in several areas. The Fire Facilities and Equipment Reserve had a balance of \$906,000 as of December 31, 2021, with \$392,000 in 2022 budgeted contributions less \$514,000 in budgeted capital expenditures (2022 budgeted items and 2021 capital carry forwards) which would result in a projected balance of \$784,000 at the end of 2022. The COVID-19 Safe Restart Grant had a balance of \$1,681,000 as of December 31, 2021. There were \$296,000 of supplemental budget requests funded on a one-time basis in the 2022 financial plan from this grant as well as the \$781,000 of capital projects carried forward from prior years that were designated to be funded from this grant leaving \$604,000 available in 2022. While there are some additional COVID-19 related costs and revenue shortfalls occurring, there is adequate funding remaining in this grant to cover \$200,000 of this purchase.

With Council's approval, Staff will also make application to the Union of BC Municipalities Composite and Volunteer Fire Department Training and Equipment Fund for \$30,000. If successful, this Fund will help offset the financial impact the Fire Facilities and Equipment Reserve.

Previously, SCBA replacement was budgeted on an incremental replacement schedule where \$45,000 (combination of operating & capital budget) was budgeted to be purchased every year in the 5-year plan rather than purchased in bulk. Due to the updated NFPA standards described above the buying schedule would shift from purchasing a small quantity every year to planned bulk procurement. The long-term financial plan would be updated to replace SCBA units as they reach their end of life. Rather than budget an annual number of expenditures for SCBA replacement, an annual amount would be contributed to the reserve based on the long-term plan which would then be spent on future bulk procurement.

Due to an updated evaluation of needs and priorities, the Station 81 Compressor Fill Station budgeted for \$38,000 and the Car 72 Fire Vehicle budgeted for \$55,000 (both budgeted to be funded from the Fire Facilities and Equipment Reserve) will be postponed, revised, and potentially brought forward as budget request in a future financial plan depending on needs.

In the adopted 2022 Financial Plan there also exists \$45,000 for SCBA – Replacement Units (combination of operating & capital). The planned 2022 purchase of a \$6,000 RIT PAK III will be included in this purchase but altered to purchase 3 smaller RIT PAK's for \$3,500 each. The smaller RIT PAK's are better suited for use on LCFD apparatus with storage space limitations.

Given the complexity of operating 7 models in the SCBA fleet, the age and condition of the SCBA fleet, the opportunity to immediately address safety concerns and the positive long-term financial implications, Staff is recommending Option A and the subsequent amendment to the 2022 Financial Plan.

Option A Funding

Source	Sub Total
2022 SCBA Capital and SCBA Operating	\$45,000
2022 SCBA Compressor	\$38,000
2022 C72 Command Truck	\$55,000
2022 RIT PAK III	\$6,000
2022 COVID-19 Safe Restart Grant	\$200,000
2022 UBCM Fire Department Training and Equipment Fund	\$30,000
2022 Fire Facilities and Equipment Reserve	\$276,000 (\$306,000 without UBCM Fund)
Estimated Total \$650,000	

The current inventory of legacy SCBA, mid-life SCBA, SCBA masks and Voice Amplifiers will be offered as trade-in during the procurement process. Staff have researched market value for this trade-in and estimate that \$30,000 could be recovered to offset the impact the Fire Facilities and Equipment Reserve. If Option A is approved, Staff would develop a 20-year financial plan for the Lake Country Fire Department that includes future consideration of Self-Contained Breathing Apparatus in the Fire Facilities and Equipment Reserve as required.

Option B Funding

Source	Sub Total
2022 SCBA Capital and Operating	\$45,000
2022 SCBA Compressor	\$38,000
2022 C72 Command Truck	\$55,000
2022 RIT PAK III	\$6,000
2022 UBCM Fire Department Training and Equipment Fund	\$30,000
2022 Fire Facilities and Equipment Reserve	\$ 476,000 (\$506,000 without UBCM Fund)
Estimated Total \$650,000	

The current inventory of legacy SCBA, mid-life SCBA, SCBA masks and Voice Amplifiers will be offered as trade-in during the procurement process. Staff have researched market value for this trade-in and estimate that \$30,000 could be recovered to offset the impact the Fire Facilities and Equipment Reserve. If Option B is approved, Staff would develop a 20-year financial plan for the Lake Country Fire Department that includes future consideration of Self-Contained Breathing Apparatus in the Fire Facilities and Equipment Reserve as required.

COMMENTS FROM EXTERNAL AGENCIES, COMMITTEES AND STAKEHOLDERS

Not applicable.

CONSULTATION AND COMMUNICATION

Staff have researched applicable grants and determined that the COVID-19 Safe Restart Grant is applicable to this purchase. Accessing \$200,000 from this Fund is an internal process and is compliant with the Fund's guidelines. A smaller Fund that may provide the District an additional \$30,000 toward this SCBA Safety Compliance Upgrade is the UBCM Composite and Volunteer Fire Department Training and Equipment Fund. The District can apply for up to \$30,000 to help offset the impact to the Fire Facilities and Equipment Reserve.

The UBCM website states:

The intent of this funding stream is to build the resiliency of volunteer and composite fire departments in preparing for and responding to emergencies through the purchase of new or replacement equipment and to facilitate the delivery of training. Ongoing operational costs and the purchase of major fire apparatus are not eligible [Volunteer & Composite Fire Department Training & Equipment | Union of BC Municipalities \(ubcm.ca\)](#)

Staff have prepared a draft application for the Composite and Volunteer Fire Department Training and Equipment Fund and will submit the application with Council's approval. The deadline for submission to the UBCM Composite and Volunteer Fire Department Training and Equipment Fund is October 21st, 2022. It is unclear if this fund will run again in 2022.

ANALYSIS OF OPTIONS FOR CONSIDERATION

Staff thoroughly investigated options for legacy SCBA, mid-life SCBA and considered the future demands on the LCFD fleet of SCBA. Staff is confident that Option A offers the District a hybrid financial approach that uses the optimum strategy of both renewal and replacement. Utilizing COVID 19 Restart Funds, UBCM Composite and Volunteer Fire Department Training and Equipment Funds and trade-in value to support the SCBA Safety Compliance Upgrade mitigates a portion of the financial impact. Shifting from annual procurement to planned bulk purchased will allow the District to set aside capital funding with a clear plan to support future needs. This shift in budgeting strategy will also allow the District to maintain a healthy balance in the Fire Facilities and Equipment Reserve for upcoming apparatus replacements.

This proposal, if approved, will make an immediate and significant impact on the health and safety of firefighters serving the District of Lake Country. It will also manage risk by ensuring that the fleet of SCBA operated by the LCFD is fully compliant with WorkSafe BC Regulations and NFPA Standards.

Procurement and delivery of new SCBA is estimated to take 6-months. With current supply chain issues this delivery timeline may be extended based the demand for new SCBA in the fire service. Delaying approval will extend the time frame for delivery and delay mitigating the safety and risk issues. The District would also miss the deadline for application to the UBCM Composite and Volunteer Fire Department Training and Equipment Fund. This decision by Council, will guide Staff in establishing a sustainable financial plan for the management of critical SCBA assets through 2037 and beyond.

LCFD Senior Staff thank Council for their thoughtful consideration of this proposal. LCFD Senior Staff would like to acknowledge Senior Staff from the across the District that provided thoughtful input and expert guidance.

Respectfully Submitted,
Darren Lee, Fire Chief

Report Approval Details

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Attachments:	- RFCD-SCBA Compliance-2022-D. Lee Mixed Funding Aug 8.docx
Final Approval Date:	Aug 31, 2022

This report and all of its attachments were approved and signed as outlined below:

Trevor James, CFO, Director of Finance & Administration - Aug 30, 2022 - 10:40 AM

No Signature found

Reyna Seabrook, Director of Corporate Services - Aug 30, 2022 - 10:54 AM

Tanya Garost, Chief Administrative Officer - Aug 31, 2022 - 4:55 PM