TOWN OF TILLSONBURG

SERVICE CONTRACT ASSESSMENT

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TILLSONBURG, ONTARIO
N4G 5A5

VERSION 1.0

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REVISION LOG

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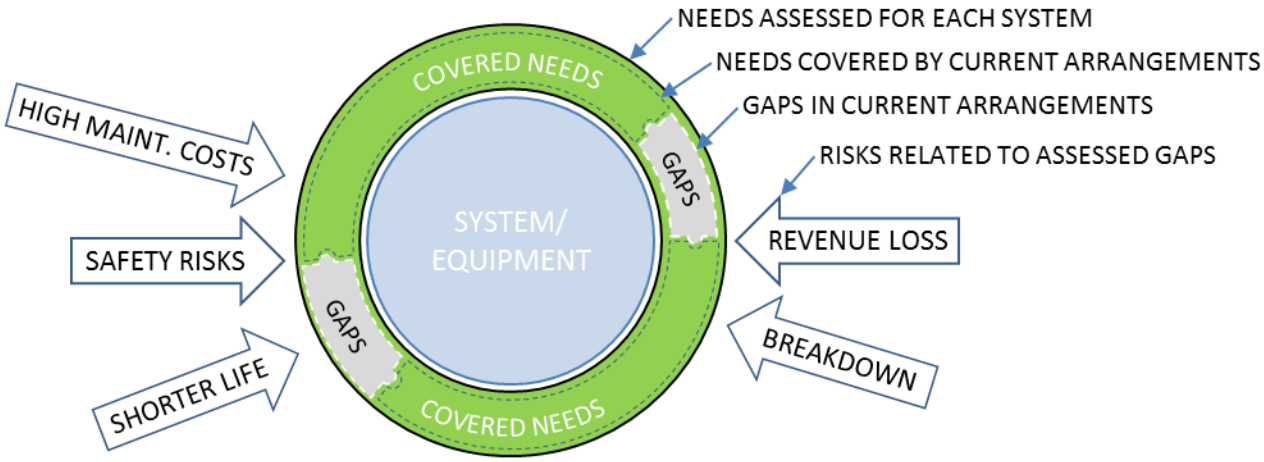
1.0 Introduction

This report contains an assessment for needs and gaps in the service programs for the refrigeration and cogeneration systems recently installed at the Tillsonburg Community Center. The systems were assessed to determine essential requirements of service programs, gaps in existing service programs, and risks associated with not filling these requirements.



In addition to this, a skills assessment was carried out to ascertain how existing skills may be leveraged to fill operating and service requirements for these systems.

In conducting this assessment, it was found that:

- Existing plant operators can provide daily maintenance and operation of the cogeneration system, as the operation of this system is not regulated.
- The existing refrigeration system service contract is ill defined and due to end after the 2018-2019 season.
- The cogeneration system's Combined Heat and Power (CHP) units do not currently have a maintenance program.
- In-House maintenance of the CHP units is feasible and may be much more cost effective than offered protection plans.
- Plant personnel maintenance training and a facility parts acquisition plan may be considered for the CHP units in place of the Factory Protection Plans (FPPs) offered by Capstone (manufacturer).
- The cogeneration system's mechanical installation does not require a service contract but may be included with the refrigeration system service contract.
- The cogeneration system's automation system installer should be retained on a time and material basis to provide annual maintenance.

A comprehensive service framework has been provided in the report to provide steps for soliciting and obtaining service needs going forward. An evaluation matrix is provided to ensure that service offers are evaluated on more than cost.

2.0 In-House Skills Review

This section contains information available to I.B. Storey Inc. at this time and will be modified as required if more information is provided by the Town.

This section assesses facility staff skills and how they are applicable to the operation and maintenance of the newly installed refrigeration and combined heat and power systems. The assessment considers transferable skills and minor upgrades to skills that may allow for in-house maintenance. The following contains a review of in-house skills as provided to I.B.Storey.

Class B Refrigeration Operator

- Regulated by the Operating Engineers of Ontario Act.
- Certified for operation of mechanical, control, and instrumentation equipment in a refrigeration room.

Comments and Observations

- Skills available for the daily operation and maintenance of the refrigeration system can also be applied to the operation of other similar systems.
- Operation of the automation and CHP systems are not regulated, allowing existing skills to be transferred as is.
- Lack of existing in-house refrigeration mechanics makes carrying out preventative maintenance for the refrigeration system infeasible.
- Technical aptitude may be leveraged to provide maintenance for the other systems.

3.0 Gap Assessment

The gap assessment takes into account the essential services and skills needed to operate and maintain the systems installed at the Tillsonburg Community Center and the skills and services currently available for these systems. For each system, current arrangements are assessed to ascertain what needs are being met and what gaps exist. Needs which are not being met are known as gaps and are assessed for risks in the next section.

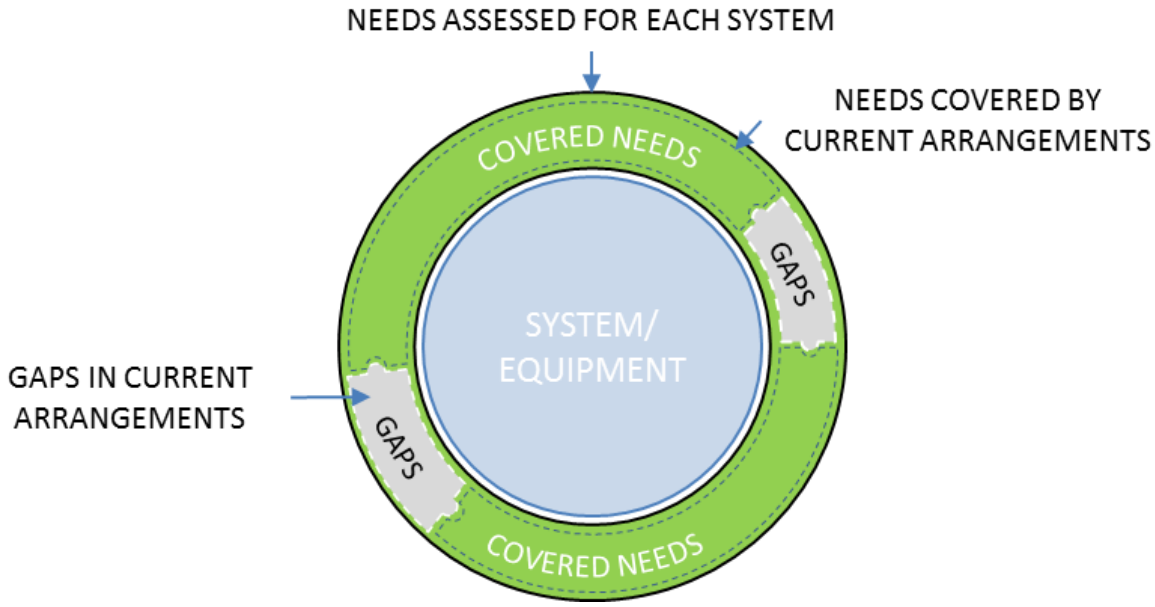


Figure 1: Needs and Gaps Assessment

3.1 Refrigeration System

Table 1 below includes an assessment of the current service provision for 2018-2019 by CIMCO Refrigeration, with gaps identified. Items which are broadly covered by the service provision but not properly defined in the service contract are noted in the table as well.

Table 1: Refrigeration System Assessment

Service & Skills Needs	Current Status	Gap	Possible Actions
3rd Class Power Engineer/Class-B Refrigeration Operator – Chief.	Available	No	-
O/M Manuals.	Being prepared by refrigeration contractors	No	-
Maintenance Contract or In-House Maintenance Capability (CRM).	Cimco Service Contract for 2018-2019 Season	No	Solicit and obtain new service contract
Annual Compressor Maintenance.	Included in Existing Contract	No	Include in a new contract
Annual Safeties Testing and Tagging	Included in Existing Contract	No	
Annual Ammonia Leak Detection Calibration	Included in Existing Contract	No	
Refrigeration System Fluids Maintenance, Unit Prices and Inventory.	Only Glycol Testing is Included in Existing Contract	Yes	Add comprehensive maintenance to new contract
Plant Maintenance Inspections.	Four (4) Included in Existing Contract	No	Include in a new contract. Rates and structures for service provisions should be defined in contract.
Plant Maintenance Inspection Schedule.	Not Defined in Existing Contract	Yes	
Readily Accessible Parts and Materials Inventory	Not Defined in Existing Contract	Yes	
Parts and Materials Rate & Structure	Not Defined in Existing Contract	Yes	
Demand & Emergency Maintenance Structure	Not Defined in Existing Contract	Yes	
Demand & Emergency Labour Rate	Included in Existing Contract	No	
Maintenance Materials Disposal Rates & Structure	Not Included or Defined in Existing Contract	Yes	
Service Warranty	Not Included or Defined in Existing Contract	Yes	
Permits, Fees, and Licenses	Not Included or Defined in Existing Contract	Yes	

Observations and Comments

- Skills and personnel required for daily operation and maintenance are available.
- Existing service contract ends at the end of the 2018-2019 season.
- Major equipment preventative maintenance included in existing service contract.
- Lack of pre-defined schedules and structures in existing service contract.

3.2 Combined Heat and Power (CHP) Units (Co-Generation System)

There is currently no service agreement or capability at the Tillsonburg community centre for the combined heat and power generating units. Table 2 below contains services essential for the maintenance of the system, including a review of Capstone Factory Protection Plan (FPP) plan C contract provided by Whitby Hydro Energy Services Corp (WHESC).

Table 2: Combined Heat and Power Units Assessment

Service & Skills Needs	Current Status	Gap	FPP Offer - Plan C	Possible Actions
Operator for Daily Operation, Maintenance, and Troubleshooting	Plant Operators Fill This Role	No	-	-
O/M Manuals	Available	No	-	-
Capstone Authorized Service Provider for Maintenance Labour	No Existing Arrangements	Yes	Not Included	Obtain Capstone Authorised Service Provider (ASP) training for a plant operator.
Preventative Maintenance Parts Acquisition or inventory	No Existing Arrangements	Yes	Included	Maintain reserve funds as appropriate to acquire parts when needed.
Demand & Emergency Parts	No Existing Arrangements	Yes	Included	

Observations and Comments

- No maintenance program currently in place.
- Capstone Factory Protection Plan (FPP) contract proposed by WHESC provides parts for preventative and demand Maintenance but does not include labour.
- Plant operators may be trained as Authorised Service Providers to provide preventative and emergency maintenance services for the co-generation system.
- Three (3) installed generation units provide redundancy in the case of an emergency or in the event of regularly scheduled maintenance, allowing greater flexibility in service schedules.

3.3 Mechanical Heat Recovery Sub-System (Co-Generation System)

Table 3 below shows the essential skills and service requirements for the mechanical heat recovery system.

Table 3: Mechanical Heat Recovery System Assessment

Service & Skills Needs	Current Status	Gap	Possible Actions
Operator for Daily Operation, Maintenance, and Troubleshooting	Plant Operators Fill This Role	No	-
O/M Manuals	Being prepared by the mechanical contractor	No	-
Plumbing and Pumps Preventative Maintenance Labour Capability	Can Be Provided By Plant Operators	No	-
Preventative Maintenance Parts Acquisition & Inventory	No Existing Arrangements	Yes	Include in refrigeration contract
Plumbing and Pumps Preventative Maintenance plan	No Existing Arrangements	Yes	
Glycol Testing and Maintenance	No Existing Arrangements	Yes	
Heat Exchanger Maintenance	No Existing Arrangements	Yes	
Demand & Emergency Parts and Materials Acquisition or Inventory	No Existing Arrangements	Yes	

Observations and Comments

- No service program or contract is currently in place for this system.
- Due to the small size of the system and simplicity of its components, a separate service contract is not required for this system. It is recommended that the maintenance for this system be included in the next refrigeration service contract.
- Preventative maintenance of pumps and piping system can be carried out by plant operators.
- Preventative maintenance of heat exchangers is best carried out by experienced mechanics.

3.4 Automation Sub-System (Co-Generation System)

Table 4 below shows the essential skills and service requirements for servicing the newly installed automation system.

Table 4: Automation System Assessment

Service & Skills Needs	Current Status	Gap	Possible Actions
Operator for Daily Operation, Maintenance, and Troubleshooting	Plant Operators Fill This Role	No	-
O/M Manuals	Available	No	-
Maintenance Labour Capability	No Existing Arrangements	Yes	Hire installer on a time and material basis as needed.
Annual Alarm Log Analysis	No Existing Arrangements	Yes	Retain installer annually
Automation System Annual Functionality Tests and Firmware Updates	No Existing Arrangements	Yes	
Demand & Emergency Parts Inventory	No Existing Arrangements	Yes	

Observations and Comments

- No service program or contract is currently in place for this system.
- Components in this system are maintenance free or low maintenance; however, qualified personnel should be retained if repairing or replacing electrical components.

4.0 Risk Assessment

This section details the risks involved in having the gaps that have been outlined in Section 3 above. Risks involved in having these gaps may include major consequences like unforeseen costs and lost revenue due to equipment downtimes.

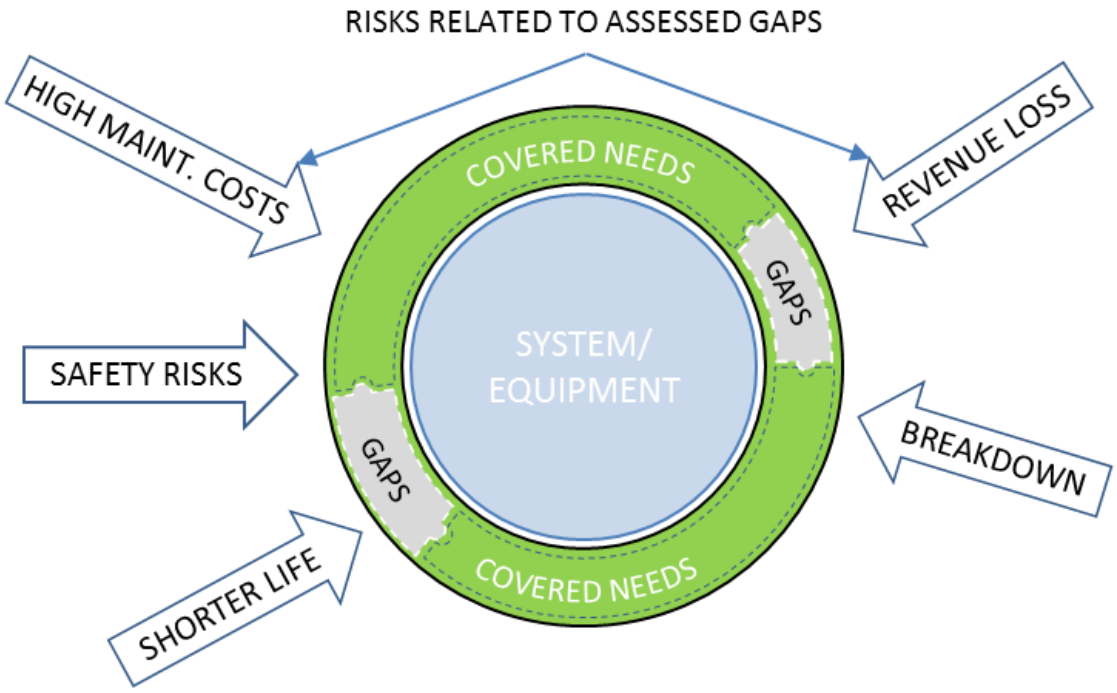


Figure 2: Risks Associated to Existing Gaps are Assessed

Gaps are analysed based on the risk they pose to each system and risk levels may differ for similar gaps between different systems. They are assessed for risk in the following three categories:

- **Life Safety**: this is the level of risk posed to the safety of facility personnel and users, as well as the surrounding community.
- **Operations & Revenue**: this is the level of risk posed to the operation of the facility and revenue.
- **Maintenance Cost**: this is the level of risk posed to the maintenance costs that will be incurred.

4.1 Refrigeration System Risk Assessment

The refrigeration system is currently covered by a service contract, helping ensure that major equipment maintenance is covered. However, it is noted that the existing refrigeration service contract is not comprehensive and is ill defined. This lack of definition leads to ambiguity and may become a liability to The Town in certain circumstances. In addition, this service contract only covers the refrigeration system for the 2018-2019 season. A new arrangement will need to be made, ensuring that all gaps noted are covered, to avoid the risks noted below.

Table 5: Refrigeration System Risks

Gap	Risk Description	Risk Level		
		Life Safety	Operations & Revenue	Maint. Costs
Fluids Maintenance, Cost, and Inventory.	• Lack of maintenance of system fluids like brine and ammonia may lead to corrosion and costly repairs. • Fluid testing reveals ammonia migration and leaks which result from degrading equipment as in the recent Fernie incident. • Lack of predefined pricing may lead to arbitrary pricing when needed.	Medium	High	High
Preventative Maintenance Schedule.	• Major equipment maintenance should coincide with shut down or low usage times to prevent unwanted downtime.	None	Low	None
Readily Accessible Parts and Materials Inventory	• Ready access may prevent or reduce downtime during unscheduled maintenance. • Costs to acquire parts may be inflated due to expedited acquisition.	None	Low	Low
Parts and Materials Rate & Structure	• Rates can be decided arbitrarily by contractors if not negotiated as part of a contract. • Maintenance actions may lack predictability and accountability. • Contractors may send too few or too many employees to site if man power requirements are not defined.	None	None	Medium
Demand & Emergency Maintenance Structure		None	Low	Medium
Maintenance Materials Disposal Rates & Structure		None	None	Medium
Permits, Fees, and Licenses	• Without proper oversight the plant licenses may become out of date, causing a necessary plant shut down.	None	Medium	None

Comments

- Maintaining a service program for the refrigeration system is critical due to the system size and complexity, safety considerations, and lack of in-house maintenance skills.
- A new service arrangement should be made prior to the expiration of the current arrangement.
- A lack of structure and maintenance schedules in the existing service contract reduces effectiveness.
- Lack of testing and maintenance of the system fluids allows exacerbation of corrosion and rust problems, leading to damage of system components (pumps, heat exchangers, etc.) and increased accident risks.

4.2 Combined Heat and Power (CHP) Risk Assessment

The combined heat and power plant is a secondary provider of both electrical and thermal power for the facility. As these units have few moving parts, there is a lower risk of system failure; however, in the event of failure, the system has a redundancy of one (1) unit. While the risk of system failure is low, arrangements for maintenance should be made in other to ensure equipment life and operations savings.

Table 6: Combined Heat and Power System Risks

Gap	Risk Description	Risk Level		
		Life Safety	Operations & Revenue	Maint. Costs
Capstone Authorized Service Provider for Labour	• An Authorised Service Provider is required by Capstone Corporation to provide maintenance to the CHP units.	None	Very Low	Low
Preventative Maintenance Parts Acquisition or Inventory	• Lack of agreement for obtaining parts may lead to unexpected costs. • In the case of acquiring parts in-house, lack of, or inadequate, maintenance reserve funds may lead to future budget disruption and service delays.	None	Very Low	Medium
Demand & Emergency Parts		None	Very Low	Medium

Comments

- Obtaining labour capabilities is essential to ensure that manufacturer equipment troubleshooting and maintenance can be carried out.
- To reduce maintenance labour costs, Capstone Authorized Service Provider (ASP) training can be obtained as an upgrade to in-house skills.
- To ensure that parts can be obtained as needed, an adequate maintenance reserve (annual or lump sum) should be maintained.

4.3 Mechanical Heat Recovery System

The mechanical heat recovery system is composed of insulated piping, glycol, pumps, and heat exchangers. Most of these system components have low maintenance requirements and may be covered under other similar contracts.

Table 7: Mechanical Heat Recovery System Risks

Gap	Risk Description	Risk Level		
		Life Safety	Operations & Revenue	Maint. Costs
Preventative Maintenance Parts	• Lack of common preventative maintenance parts may cause issues with equipment and delay necessary maintenance procedures, potentially causing system downtime.	Low	Very Low	Medium
Glycol Testing and Maintenance	• Lack of maintenance of system fluids like brine and ammonia may lead to corrosion and costly repairs.	Low	Very Low	Medium
Heat Exchanger Maintenance	• Heat exchanger periodic internal maintenance required to ensure equipment life span	Low	None	Low
Demand & Emergency Parts and Labour Rate & Structure	• Materials and labour may be required for unscheduled and emergency maintenance	None	Very Low	Low
Maintenance Materials Disposal Rates & Structure	• Unexpected regulated disposal fees.	None	None	Low

Comments

- Obtaining a standalone maintenance contract for this system is not critical as the mechanical system is low maintenance and most maintenance items can be carried out by facility personnel.
- Maintenance of the mechanical system, including glycol testing and heat exchanger periodic maintenance, can be added onto the service contract of the refrigeration system.
- Demand & Emergency parts and labour rates & structures are not critical for this system.

4.4 Automation System

The automation system components are mostly maintenance free and, with the exception of software updates and annual system functionality checks, only demand & emergency considerations are required.

Table 8: Automation Service and Maintenance

Gap	Risk Description	Risk Level		
		Life Safety	Operations & Revenue	Maint. Costs
Maintenance Labour	• Automation system experience is ideal for functionality tests and unscheduled maintenance to avoid system downtime. • Qualified electricians are needed for some parts replacement works.	None	Very Low	Very Low
Annual Alarm Log Analysis	• Annual alarm log analysis is recommended to keep abreast of the system's health.	None	None	Very Low
Automation System Annual Functionality Tests and Firmware Updates	• While not mandatory, annual functionality tests ensure that all components and control sequences are functional.	None	Very Low	Very Low
Demand & Emergency Parts Inventory.	• While the system is low maintenance, having a few spare parts helps mitigate unforeseen parts failures.	None	Very Low	Very Low

Comments

- Obtaining a maintenance program is not critical for this system but may be pursued.
- In the event that no service contract is obtained, an automation contractor should be called in annually for firmware maintenance.

5.0 Service Solicitation Framework

This section provides a framework by which service needs can be solicited, or met in-house, in order to ensure all technical needs are accounted for. Technical understanding and experience with each system being considered is required while implementing this framework. Considerations in the following framework include steps that should be taken when preparing for a solicitation, preparation of solicitation documents, facilitation of solicitation, and a template for choosing the successful service provider. Considerations for in-house provision of service needs are also included.

Overviews of the four (4) installed systems are provided before the framework is laid out. One service contract may be sought to cover multiple systems.

5.1 Systems Overview

5.1.1 Refrigeration

The refrigeration system at the Tillsonburg community center consists of the following:

- MYCOM ammonia compressors,
- Liquid pumps,
- Ammonia high and low pressure piping,
- Brine and glycol piping,
- Heat exchangers,
- And an evaporative condenser.

Several safety devices are installed to ensure safe operation of the system and ability for mitigation in the case of an emergency. Equipment manufacturers provide recommended maintenance practices which must be fulfilled to ensure safety, equipment life, and prevent loss of service. These maintenance requirements should be included in all service arrangements. While the daily operation and maintenance of a refrigeration plant should be handled by refrigeration plant operators, items such as compressor oil replacement and compressor overhaul must be carried out by experienced certified refrigeration mechanics (CRMs). The service provider should keep essential spare parts available for all equipment. All of the above, as well as fluid testing and balancing would fall under the scheduled preventative maintenance and a base price and estimated hours should be requested. More specific prices could be sought for shutdown maintenance, compressor overhaul, and pre-start-up inspection for the refrigeration equipment including estimated hours and the cost for regasketing each heat exchanger.

Additional pricing for items such as glycol, brine, ammonia, water treatment chemicals, compressor oil, and new belts should be sought including the estimated service hours. This will ensure that, at the option of the Owner, any concerns with these systems can be mitigated.

5.1.2 Combined Heating and Power

The Combined Heat and Power (CHP) system consists of three (3) Capstone C65 Micro Turbine units located outside the building. These units supply electricity to the building, supplementing grid electricity, and provide heating to the heat recovery loop. The system has a full redundancy of one (1) unit, providing a cushion in the case of an emergency. Each unit runs for approximately 6500 hours a year.

Service arrangements should take the following into account:

- A Capstone Authorized Service Provider (ASP) must be available to provide ongoing maintenance and diagnosis for the CHP units.
- Preventative maintenance and parts replacements should be diagnosed by the maintenance person.
- The turbine engine should be overhauled once unit performance starts to degrade (determined using monitoring and verification system).
- Parts acquisition maintenance reserve funds should be maintained to ensure funds are available to purchase parts as needed.

For a minimum risk option, Capstone offers four (4) different Factory Protection Plans (FPP) covering either just parts or parts and labour for and provides training to enable in-house maintenance. Options for servicing the units include:

- Obtaining an FPP (and providing ASP training to a plant operator for Plans A and C),
- Providing ASP training to a plant operator, and purchasing parts as required for complete in-house maintenance.

Table 9: Service Options Including Capstone FPPs and In-House Parts and Labour Acquisition

Service	Plan A	Plan B	Plan C	Plan D	In-House[1]
Duration	5 Years	5 Years	9 Years	9 Years	-
Turbine Run Hours (up to)	39,999	39,999	79,999	79,999	-
Preventative Maintenance Parts	Yes	Yes	Yes	Yes	Yes
Demand Maintenance Parts	Yes	Yes	Yes	Yes	No
One Engine Overhaul	No	No	Yes	Yes	Yes
Maintenance Labour	No	Yes	No	Yes	No
Annual Cost[2]	$ 25,000	$ 35,000	$ 45,000	$ 58,000	$ 17,000 - 60,000[3]
Capstone ASP Training – 1st Year[4]	$ 3,250	-	$ 3,250	-	$ 3,250
ASP Refresher – 2nd Year Plus	$ 650	-	$ 650	-	$ 650
5 Yr. Total	$ 130,000	$ 175,000	$ 230,000	$ 290,000	$ 90,000 – 305,000
9 Yr. Total	$ 235,000	$ 315,000	$ 415,000	$ 520,000	$ 160,000 – 550,000

[1] *Annual Cost range for parts obtained on an as needed basis up to parts obtained on Capstone recommended schedule.*
[2] *All costs are estimates with the exception of Plan C which is available from WHESC proposal.*
[3] *From discussion with representatives of the manufacturer, costs are anticipated to be on the low end of this range, however there is a small risk of large single time costs in the event of major equipment failure.*
[4] *Excluding travel expenses and labour costs.*

In making a decision regarding the service arrangements for the CHP units at the Tillsonburg community centre, the following items should be noted:

- Annual maintenance time for each unit ranges from 1 to 16 hours, making in-house labour very feasible.
- The units have one moving part, greatly reducing the chances of unforeseen breakdowns.
- As shown in Table 10, Capstone's recommended schedule is conservative and units may run for much longer without needing replacements.
- From discussion with Capstone manufacturer representatives, the maintenance costs for the FPP include pre-emptive part replacement, while most maintenance is generally done on an as-needed basis for equipment.
- Refurbished parts may be purchased to save on cost.

Table 10: Major Maintenance Intervals for Capstone Units at 6500 Annual Run Hours

	Capstone Recommended Schedule[5]		**Maintenance Performed as Required**	
	Turbine Run Hours	Resulting Interval	Turbine Run Hours	Resulting Interval
Engine Overhaul	40,000	6 Years	> 80,000	> 12 Years
Battery Replacement	20,000	3 years	> 40,000	> 6 Years
Compressor Replacement	40,000	6 Years	> 60,000	> 9 Years

From consultation with the manufacturer, it is expected that annual maintenance will cost significantly less than maintaining an FPP. Based on this, an in-house maintenance strategy is recommended. A self-funded maintenance program should be considered.

- **By using more reasonable maintenance intervals for equipment the overall costs can be spread over a longer time.**
- **Annual funds of $45,000 or less could be allocated to equipment maintenance (matching FPP C provided in a quote from WHESC). Unspent funds could be held in reserve for future unanticipated maintenance or upgrades.**
- **Equipment maintained with appropriate basic preventative maintenance can be operated for long periods of time (refer to Table 10) with little risk.**
- **Equipment failure risks are low based on the nature of the equipment, and the redundancy in the system.**

If a maintenance strategy with limited risk is preferred then a Factory Protection Plan from the manufacturer can be pursued. This will increase the maintenance cost overheads significantly, but remove all risk of potential hardware failure.

[5] *Capstone recommended maintenance schedule is based on units operating in standalone mode, while the installation in question is a grid-connected system.*

5.1.3 Mechanical

The mechanical system consists of the follow:

- Hot glycol piping and insulation from the CHP units to several loads in the facility,
- Liquid pumps,
- Several heat exchangers.

Similar to the refrigeration system, manufacturers provide recommended maintenance practices that should be included in all service arrangements. Preventative maintenance would include inspections for all heat exchangers, pumps, and valves connected to the mechanical system. Plant operators are able to provide most maintenance for the system without additional training and a mechanic can be retained periodically to perform more long term maintenance like heat exchanger cleaning. If a service contract is obtained, the service provider must carry out recommended practices for replacing seals and gaskets and should include estimates on the time and cost of carrying out this replacement within the preventative maintenance proposal. Given the size and relative simplicity of the mechanical installation, a service contract is not required for this system; however, inclusion in a refrigeration contract is recommended.

5.1.4 Automation

The automation system consists of a few automation controllers, valves, and sensors. Manufacturers provide maintenance and calibration recommendations for these components although most are maintenance free or low maintenance. Considerations to include in a service program include:

- Annual functionality tests, verification following manufacturer recommended practices,
- Calibration as needed,
- Alarm log analysis,
- Firmware updates.

If a service contract is not obtained, the system installer may be retained annually to provide these and a small parts inventory should be kept for emergencies.

5.2 Service Contract Solicitation Procedure

This section contains a framework for soliciting service contracts with examples of technical considerations included as appendices.

5.2.1 Step 1: Site Survey

In addition to information contained in the operating and maintenance manuals, a walk-through grade survey is essential for gaining an understanding of the equipment that requires maintenance and servicing at a facility. After an analysis has been done on the requirements, specific equipment model and serial numbers can be gathered and filled out into an equipment list that can be used internally and for solicitation purposes. A clear site list must be generated to ensure that nothing is overlooked, as gaps could lead to additional costs after a maintenance contract has been negotiated and accepted. Major systems, if interconnected or standalone, should be noted as such to clearly define the boundaries of the service for warranty purposes. Sample site equipment lists have been included as Appendix A. Final lists will vary from site to site.

5.2.2 Step 2: Document Generation

Once the survey is completed, solicitation documents should be prepared to obtain competitive bids from service providers. In order to ensure that the documents are comprehensive, the documents should contain the following as a minimum:

- Bidder background details, references, and qualifications
- Preventative maintenance and periodic inspection scopes, including major equipment maintenance as required by manufacturers, and maintenance as required by regulating codes.
- Maintenance schedules and expectations of number of hours for maintenance items.
- Specific price inclusions as needed for preventative maintenance, demand & emergency parts and labour, and miscellaneous items specific to a facility. Sample inclusion forms are included in Appendix B.
- Specifications of expected working hours including regular working hours, overtime hours, and cost structure.
- Inclusion of all permits and licenses required to keep the system in compliance with all regulations.
- Specification of required skills.

5.2.3 Step 3: Service Solicitation

Once a solicitation document has been developed, the document is released to the public to obtain competitive bid pricing.

5.2.4 Step 4: Evaluation of Submissions

In order to ensure that the most qualified service contractor is awarded the bid, submissions should be evaluated based on several factors. Appendix C contains an evaluation matrix that should be completed for each bidder in addition to pricing considerations.

6.0 Conclusion

In order to provide the most comprehensive service option for the installed systems at the Tillsonburg Community Center, the following is recommended:

- Solicit a comprehensive proposal for service of the refrigeration system making use of the provided framework and attached evaluation matrix.
- Include heat recovery loop service in refrigeration service scope.
- An in-house maintenance arrangement for the CHP units should be implemented to ensure parts and services are available when needed.
    - An adequate maintenance fund (equal to the cost of a service arrangement or as determined) could be maintained to facilitate this arrangement.
    - Alternately, if the minor risk that system failure occurs is a major concern, a Capstone Factory Protection Plan can be selected to remove all risk with greater annual costs.
- Provide Capstone authorized service provider training to a plant operator.
- Employ automation installer for annual functionality check and firmware updates.

APPENDIX A

SAMPLE SITE EQUIPMENT LISTS

Table 1: Site Equipment Summary Template with Examples

< Site Name & Address >						
Equipment	Model	Qty.	Capacity/Motor	Run Hours	Description	Preferred Maintenance or Shutdown Date
Compressor	MYCOM N2MII	3	60 HP	1750	Ammonia compressor	
Pump	Armstrong 4030 8x4x10	2	25 HP	-	Rink Cold Brine Pump2	
Cooling Tower	Evapco LSCE	1	3000 MBH	-	Ammonia evaporative condenser	
Heat Exchanger	Alfa Laval BW-FD	1	200 TR	-	Ammonia to Rink Brine Chiller	

Additional Equipment

- One (1) ammonia detector
- One (1) ammonia detection control panel
- Five (5) Pressure relief valves

Comments:

Annual start-up and shut down dates

APPENDIX B

SAMPLE SERVICE CONTRACT PRICE INCLUSION

Table 1: Sample Preventative Maintenace Cost Inclusion Table

Description	Estimated Number of PM Hours per Annum	Labour Rate	Extended Total
To provide preventative maintenance service		$ / hr	$
Sub-Total for **Preventative Maintenance (per year)**			$
H.S.T. + 13%			$
Total Price Preventative Maintenance (per year)			**$**
Preventative Maintenance - TOTAL PRICE FOR YY YEAR CONTRACT			**(xYY) = $**

Table 2: Sample Demand/Emergency Labour Cost Inclusion Table

REGULAR RATES:	CREW	UNIT OF MEASURE	UNIT PRICE	ESTIMATED QUANTITY	EXTENDED PRICE
Minimum Call Charge (1 Hour)	1 Man/ Crew	1 Hour	$		$
Minimum Call Charge (1 Hour)	2 Man/ Crew	1 Hour	$		$
15 Minute Increment	1 Man/ Crew	15 Minute increment	$		$
15 Minute Increment	2 Man/ Crew	15 Minute increment	$		$
OVERTIME RATES:					
Minimum Call Charge (1 Hour)	1 Man/ Crew	1 Hour	$		$
Minimum Call Charge (1 Hour)	2 Man/ Crew	1 Hour	$		$
15 Minute Increment	1 Man/ Crew	15 Minute Increment	$		$
15 Minute Increment	2 Man/ Crew	15 Minute increment	$		$
Sub-Total for Demand Service/Repairs					$
H.S.T. + 13%					$
Total Price Demand Service/Repairs (per year)					$
Demand Service/Repairs - TOTAL PRICE FOR YY YEAR CONTRACT					**(xYY) = $**

Table 3: Sample Material Cost Structure Inclusion

Item	Material Costs	Estimated Cost Of Materials	Percentage Mark-up	Extended Price
1	$0 to $100	$5,000	%	$
2	$101 to $500	$10,000	%	$
3	$501 to $1000	$20,000	%	$
Sub-total for Material Costs				$
H.S.T. + 13%				$
Total Price for Material Costs (per year)				$
Material Costs – TOTAL PRICE FOR YY YEAR CONTRACT				**(xYY) = $**

Table 4: Sample Additional Pricing Inclusions

	Description	Unit Pricing	Estimated Annual Quantity	Extended Price
1	Calcium Chloride Pellets 90% - 92% (Add Brand Name If Available) - ##kg bags	$	-	$
2	Brine Inhibitor (Add Brand Name If Available) - ## litre pail	$	-	$
3	Sodium Hydroxide Solution 50% Solution (Add Brand Name If Available) - ### ml Bottle	$	-	$
Sub-total for Additional Pricing				$
H.S.T. + 13%				$
Total Price for Additional Pricing (per year)				$
Addtional – TOTAL PRICE FOR YY YEAR CONTRACT				**(xYY) = $**

APPENDIX C

EVALUATION MATRIX TEMPLATE

Table 1: Evaluation Matrix Template

DESCRIPTION OF FACTOR	WEIGHT	TOTAL WEIGHT FOR SECTION
A. Executive Summary		
Understanding of Scope of Work	2	5
Fully Outlines Requirements of RFP	1.5	
Summarizes Key Aspects of RFP Submission	0.5	
Concise Timeline/Schedule Shown	1	
B. Organization and Industry Experience		
Description of Company	4	20
Description of Management Structure	2	
Experience in Recreation Sector	5	
Team Member Experience and Capabilities	5	
Certifications as Applicable to Facility Equipment	4	
C. Refrigeration and Heating System Service Contract Experience and References		
Reference #1 (experience scored as applicable to this RFP)	5	30
Reference #2 (experience scored as applicable to this RFP)	5	
Reference #3 (experience scored as applicable to this RFP)	5	
Reference #4 (experience scored as applicable to this RFP)	5	
Reference #5 (experience scored as applicable to this RFP)	5	
Verbal Reference Feedback (1 point per reference)	5	
D. Service Contract Work Plan and Methodology		
Level of Detail in Preventative Maintenance Schedule	13	30
Services Offered (Scope of Work)	12	
Response Times	3	
Strengths and Capabilities	2	
E. Documentation and Reporting		
Logistics of Work/Services Tracking	4	8
Samples of Required PMDSC Documentation	4	
F. Submission Content		
Clarity of Proposal (Presentation)	5	7
Required Documentation/Forms	2	
Subtotal		**100**
Subtotal Technical Score		**/100**
Does Subtotal Technical Score achieve benchmark score of 70%?		**Yes / No**