ANNEX B

TECHNICAL STATEMENT OF REQUIREMENT

GALLEY IMPROVEMENT

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

NOTICE

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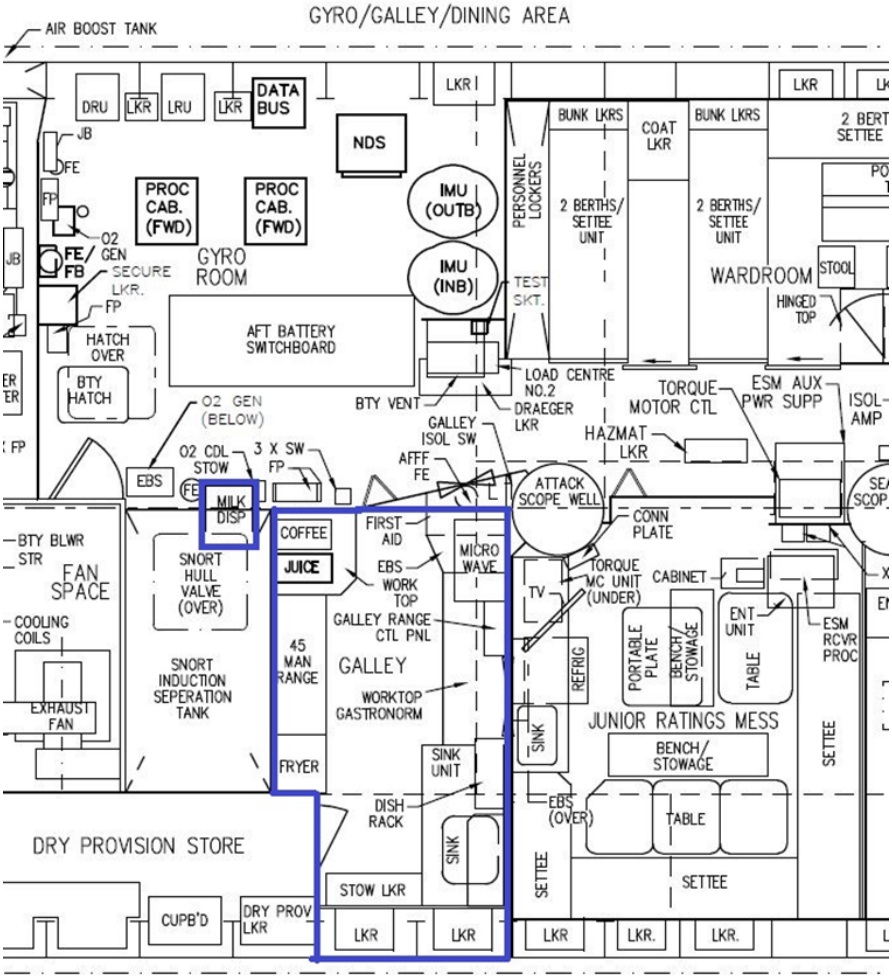
1 SCOPE

1.1 System Identification

1.1.1 A typical current Victoria Class Submarine (VCS) Galley (see Figures 1 and 2 below) includes the following components. The term typical is used because in some cases the components may vary. Both HMCS Chicoutimi and HMCS Windsor have updated their equipment.

1.1.1.1 A server counter (quantity (qty) 1), a deep fat fryer (qty 1), a range and control power supply box (qty 1), a coffee machine (qty 1), a milk dispenser (qty 1), a juice dispenser (qty 1), a fridge (qty 1), a microwave oven (qty 1), a main sink (qty 1), a stewards sink (qty 1), a dry provision store (qty 1), and stowage lockers.



Note: The stewards sink is below the microwave in the above diagram.

Figure 1-Current Galley Physical Boundaries

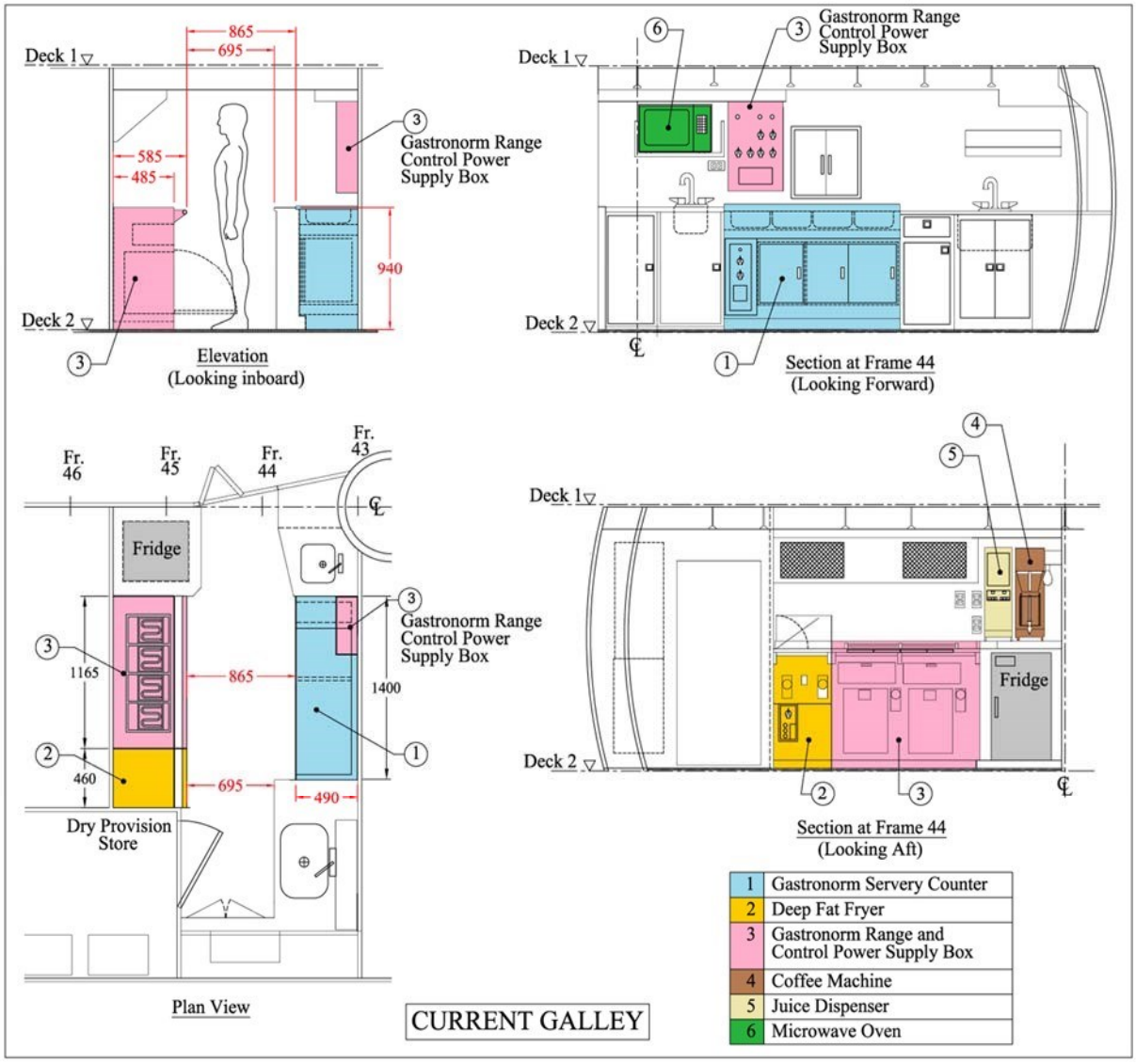


Figure 2-Current Galley Configuration Layout

1.2 Current System Overview

1.2.1 Range and Control Power Supply Box

1.2.1.1 The range consists of four hotplates, two ovens and two hot cupboards. The ranged has a hinged folding cover that serves as additional counter space when the hot plates are not being used. The hotplates are used for frying, boiling water, making the daily soup, sauces, searing and sometimes to reheat the food for serving the meal. The ovens are used for baking, roasting and reheat of the food for serving the meal. The hot cupboards are used for keeping prepared food hot. The controls for the oven temperature are on the front of the oven.

1.2.1.2 The control power supply box (which is located over the servery counter) controls the power supply to hotplates and the ovens.

1.2.2 Servery Counter

1.2.2.1 The servery counter stores cooked food at the correct temperature. The servery counter consists of a stainless steel removable cover (which when on provides work counter space for meal preparation) over an electrically heated food dish well (which accommodates four food pans) and hot cupboards. Electrical controls for the food dish well and hot cupboard heating elements are on the front face of the unit.

1.2.3 Deep Fat Fryer

1.2.3.1 The deep fat fryer (where still fitted) was intended to heat cooking oils so that food can be covered in hot oil to be cooked. It is no longer used in food preparation, and in some installations, where still installed supports an induction cook top and in others, where it has been removed it has been replaced by a storage cabinet (see below) the top of which provides additional counter space

1.2.4 Coffee Machine

1.2.4.1 The coffee machine provides on demand coffee and hot water for the crew 24/7.

1.2.5 Juice Dispenser

1.2.5.1 The juice dispenser is not used to provide juice. It is used to provide self-serve cool drinking water 24/7.

1.2.6 Milk Dispenser

1.2.6.1 The milk dispenser is located just outside the galley and provides on-demand fresh milk for cooks and crewmembers. The cooks make two cream style soups a week. Also the preparation of macaroni and cheese uses a significant amount of milk. The crew needs milk available, but does not consume large amounts of milk.

1.2.7 Refrigerator

1.2.7.1 The refrigerator keeps leftover food and condiments cool. It is not used by the cooks during meal preparation.

1.2.8 Microwave Oven

1.2.8.1 The microwave oven is used to reheat meals for the crew who did not eat at the set meal times and to reheat leftovers and popcorn during off-watch periods. It is not used by the cooks during meal preparation.

1.3 Current Galley Issues

1.3.1 Specific issues with the current galley include:

1.3.1.1 The range's oven and hot plates no longer maintain their intended temperature and require frequent adjustment.

1.3.1.2 The range cannot prepare meals that require slow cooking because the ovens do not provide consistent reliable heat;

1.3.1.3 The range cannot steam foods;

1.3.1.4 The hot plates can take up to an hour to boil water;

1.3.1.5 The oven and hot plates are difficult to clean after use as food can fall into their openings;

1.3.1.6 The oven is becoming electrically unsafe due to deterioration of the wire element interfaces;

1.3.1.7 The control power supply box for the range is opposite the range over the servery counter and obstructs useable space on the counter;

1.3.1.8 The range control power supply box is not electrically sound as there seems to be some contact cracking or buzzing;

1.3.1.9 The deep fat fryer is no longer used (deep fried food is no longer considered healthy eating);

1.3.1.10 The juice dispenser is now just used to dispense cold drinking water;

1.3.1.11 The milk dispenser, while used when refill cartons are available, cannot be used when the submarine is deployed beyond North America due to the format of available cartons;

1.3.1.12 The main sink and steward's sink will remain in their current locations. The main sink will not be affected by the improved galley design. If possible a larger stewards sink will be included in the improved galley design;

1.3.1.13 The garburator will remain in its current location and will not be affected by the improved galley design;

1.3.1.14 The servery window to the Junior Rate's mess will remain in its current location and will not be affected by the improved galley design;

1.3.1.15 The current ventilation system is adequate and will not be affected by the improved galley design;

1.4 Assumptions

1.4.1 The following assumptions pertain to the improved galley design:

1.4.1.1.1 The main sink will remain in its current location and will not be affected by the improved galley design;

1.4.1.1.2 The stewards sink will remain in its current location; however, a larger steward's sink will be installed if possible, in the improved galley design.

1.4.1.2 The garburator will remain in its current location and will not be altered by the improved galley design;

1.4.1.3 The servery window to the Junior Rate's mess will remain in its current location and will not be altered by the improved galley design;

1.4.1.4 The current ventilation system is adequate and will not be altered by the improved galley design; and

1.4.1.5 The current fire detection (Minerva) and suppression (Halon) systems over the deep fat fryer and range are adequate and will not be altered by the improved galley design.

1.5 Constraints

1.5.1 The following constraints pertain to the improved galley design:

1.5.1.1 The current range and servery have been designed to the European Gastronorm galley equipment standard. The improved range and servery equipment must be selected to a common galley equipment standard;

1.5.1.2 The identified galley equipment (or its components) must fit through a circular 915 millimeter diameter opening and be shipped through existing submarine passageways

1.5.1.3 The structural configuration of the galley and bulkheads must not be changed;

1.5.1.4 The location of the Stowage Locker (STOW LKR), Locker (LKR) and Emergency Breathing System (EBS) in the galley must not be changed;

1.5.1.5 The galley must provide no less than the current usable amount of counter space; and

1.5.1.6 The galley and galley appliances must operate using the existing power, fresh water, ventilation and waste management systems.

1.6 Galley Improvement Project Design Guidance

1.6.1 The Galley Improvement Project will replace the current system components with modern, sustainable, fit for purpose components that meet the capacity requirements as specified in their respective appendix to this annex. It is recognized that more than one equipment may be needed to meet the capacity requirements of the equipment it is replacing. For example the single range with four hot plates, two hot cupboards and two

ovens could be replaced by two single oven ranges with two hot plates each, and a single hot cupboard provided this arrangement has the same capacity and does not exceed the available weight, space and power requirements of the equipment it is replacing.

1.6.2 The improved galley design must:

1.6.2.1 Remove the deep fat fryer;

1.6.2.2 Incorporate the space vacated by the deep fat fryer in its improved galley design. The contractor may use the space freed up by the deep fat fryer to accommodate the new range or if that is not necessary, or only partially necessary, then the contractor may use this space to extend the range side countertop and provide additional storage underneath this extended counter top. The counter top may be used to accommodate additional recommended galley equipment (e.g. induction cook top or mixer or something else);

1.6.2.3 Replace the current Gastronorm range and power supply control box with a modern range equivalent set of equipment. This equipment may use a portion or all of the space vacated by the deep fat fryer. The specifications of the current galley range are included in Appendix 1 to this Annex;

1.6.2.4 Replace the Gastronorm servery counter with a modern servery equivalent set of equipment. The specifications of the current servery are included in Appendix 2 to this Annex;

1.6.2.5 Provide a food preparation area equivalent to no less than that currently available by the current range's closed top and the current servery counter's closed top;

1.6.2.6 Replace the current shallow depth refrigerator with a modern shallow depth refrigerator which has drawers as opposed to a single door. The specifications of the current refrigerator are included in Appendix 3 to this Annex;

1.6.2.7 Replace the current microwave with a modern microwave. The specifications of the current microwave are included in Appendix 4 to this Annex;

1.6.2.8 Replace the stewards sink, if possible, with one large enough to fit a 10" plate.

1.6.2.9 Remove without replacement the coffee machine. Each mess will receive a coffee machine provided through a different project;

1.6.2.10 Remove without replacement the milk machine. Ready use milk will be provided in 2 liter cartons that will be stored in the refrigerators in the galley and the messes;

1.6.2.11 Replace the current juice dispenser (which is now only used to provide chilled water on demand) with a modern system that provides chilled water on demand. Consideration may be given to relocating the chilled water system to the space vacated by the milk machine to provide additional counter space. The specifications of the current juice dispenser are included in Appendix 5 to this Annex;

1.6.2.12 Provide for increased stowage of cookware, tableware, and mixing devices.

1.7 Document Overview

1.7.1 Section 1-Scope. Section 1 includes system identification, system overview, document overview and acronyms and abbreviations.

1.7.2 Section 2-Applicable Documents. Section 2 includes the applicable Canadian Government and Non-Government documents that are referenced in this TSOR.

1.7.3 Section 3-System Requirements. Section 3 includes improved galley replacement common, general and usage requirements, required modes and sub-modes of operation, functional requirements, external interface requirements, safety requirements, quality factors, design and construction constraints, environmental, installation and human factor requirements, and maintenance requirements.

1.7.4 Subsequent appendices include:

1.7.4.1 for equipment that is being replaced, their Technical Statements of Requirement (TSOR); and

1.7.4.2 for equipment that is being removed without replacement (e.g. deep fat fryer, coffee machine and milk machine) their current specifications including power, weight and space specifications, so that these can be taken into consideration when making certain that the improved galley does not consume more power, weigh more, or take up more space than the current galley.

1.7.5 Replaced Equipment. The TSORs for the equipment to be replaced are as follows:

1.7.5.1 Appendix 1 is the TSOR for the Range and (as necessary) Control Power Supply Box (qty 1 each as necessary);

1.7.5.2 Appendix 2 is the TSOR for the Servery Counter (qty 1);

1.7.5.3 Appendix 3 is the TSOR for the Fridge (qty 1);

1.7.5.4 Appendix 4 is the TSOR for the Chilled Water Dispenser (qty 1);

1.7.5.5 Appendix 5 is the TSOR for the Microwave Oven (qty 1); and

1.7.5.6 Appendix 6 is the TSOR for the Stewards Sink (qty 1).

1.7.6 Removed Without Replacement Equipment. The specifications for the removed without replacement equipment are as follows:

1.7.6.1 Appendix 7 is the specification for the Deep Fat Fryer (qty 1);

1.7.6.2 Appendix 8 is the specification for the Coffee Machine (qty 1); and

1.7.6.3 Appendix 9 is the specification for the Milk Dispenser (qty 1).

1.8 Acronyms and Abbreviations

BIT	Built-In-Test
CA	Contract Authority or Contract Award
CM	Configuration Management or Corrective Maintenance
EDWP	Extended Docking Work Period
FMF	Fleet Maintenance Facility
HMCS	Her Majesty’s Canadian Ship or Submarine
LKR	Locker
LRU	Line Replaceable Unit
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
OEM	Original Equipment Manufacturer
OS	Operations Cycle
PM	Project Manager or Preventive Maintenance
R&O	Repair and Overhaul
RxR	Repair by Replacement
SOW	Statement of Work

STOW LKR	Stowage Locker
TA	Technical Authority
TSOR	Technical Statement of Requirement
VCS	Victoria Class Submarines

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1. 1	Drawing # 001279777	Galley Arrangement
2.	Drawing # 001279778	Galley Equipment Stowage
3.	Drawing # 001280036	Seat Galley Equipment
4.	Drawing # 001280625	Seat Galley Range Controller
5.	Drawing # 001280693	Seat Galley FR Heater
6.	Drawing # 001281386	Filter Grease Galley
7.	Drawing # 001281589	Arrangement of Electrical Equip. Galley Cover and MOD Sheet
8.	BRF 1966(25)01	Galley Range
9.	BRF 1966(25)02	Deep Fat Fryer
10.	BRF 1966(25)05	Servery Counter
11.	BR 3021(1)	Shock Manual
12.		Requirements Elicitation Document (RED), BMT Fleet Technologies dated August 2021
13.		NETE Study which includes: 1. Options Analysis Phase 1 2. Options Analysis Phase 2 Recommendations Report for a New Galley Design dated November 2017
14.	DefStan 08-160	Requirements for Electrical Installations, Issue 1, June 2003
15.	DefStan 00-250 Part 3 Section 12	Operations, Maintenance and Support
16.	DefStan 00-250 Part 3 Section 9	People Characteristics
17.	Bill C9 Chapter 9	An Act to amend the Transportation of Dangerous Goods Act, 1992
18.	D-LM-008-002/SF-001	Specification For Marking For Storage And Shipment
19.	D-01-400-001/SG-000	Engineering Drawing Practices for Class Drawing and Technical Data List
20.	C-03-000-000/NQ-E01	Treasury Board hazmat policy & HFX Class G-1 spec (see paras 33,41 & 42)

2.2 Non-Government Documents

2.2.1 Where a section of this Statement of Work (SOW) references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	**Standard**	**Title**
1.	ISO21500:212	Guidance on Project Management
2.	IEEE 15288	System Engineering
3.	ISO 9001:2008	Quality Management System - Requirements
4.	EIA-649-A	National Consensus Standard for Configuration Management
5.	MIL-STD-881 C	Work Breakdown Structures for Defense Material Items
6.	MIL-STD-1388 1A	Logistic Support Analysis
7.	MIL-STD-1388 2B 30 May 1997	DOD Requirements for a Logistic Support Analysis Record
8.	MIL-HDBK-881A 30 July 2005	Department of Defence Handbook Work Breakdown structures for Defence Materials Items
9.	MIL-STD-973	Configuration Management
10.		Bunn 23050.6001 Coffee Maker Specification Sheet
11.		HP24RO-3-5 Perlick 2 Dwr Refrigerator Specification Sheet (installed onboard HMCS WINDSOR)
12.		Silverking Majestic Series Milk Dispensers Models: SKMAJ21, SKMAJ2, SKMAJ3 115V/60Hz Specification Guide

2.3 Order of Precedence

2.3.1 In the event of a conflict between the documents in Tables 1 and 2, the SOW and the TSOR, the following Order of Precedence must apply:

2.3.1.1 SOW;

2.3.1.2 TSOR; and

2.3.1.3 The documents in Table 1 and Table 2.

2.3.2 In the event that the Contractor cannot resolve a precedence issue, the Contractor is to inform Contract Authority (CA) who will in turn seek resolution from the Technical Authority (TA).

3 SYSTEM REQUIREMENTS

3.1 General

3.1.1 Common requirements across all improved galley components (excluding pots, pans and utensils) are contained in this Annex. Element unique requirements are contained in the same section in the element TSOR.

3.1.2 Use

3.1.3 Submarine. The improved galley elements will operate within the VCS mission profile:

3.1.3.1 8 x 8 month (64) Operations Cycles (OC) (possibly extended by a further 3 x 8 month (24) OS (up to 88 months);

3.1.3.2 within each OC, there will be an alongside maintenance period of two weeks;

3.1.3.3 around the 5th OC, a 6 to 12 month Interim Docking (ID); and

3.1.3.4 at the end of the OC's, a 36 month Extended Docking Work Period (EDWP).

3.1.4 The improved galley elements must be capable of operating continuously, except for Preventive Maintenance (PM), without the requirement for removal, repair and overhaul and replacement for at least 108 months, when the submarine would be expected to go into an EDWP.

3.1.5 Galley. The galley is the area of the VCS where meals are prepared, cooked and served to the crew. The function of the galley is to:

3.1.5.1 Prepare food and beverages;

3.1.5.1.1 Cook food;

3.1.5.1.2 Serve meals to the crew; and

3.1.5.1.3 Clean cookware and table ware.

3.1.6 Food is consumed in the junior rates mess, senior rates mess and wardroom.

3.1.7 The galley provides snack foods between meals.

3.1.8 Galley Operations

3.1.8.1 General

3.1.8.1.1 The meal orders from the junior rates mess are received through the serving window. The meals are served to the junior rates through the serving window.

3.1.8.1.2 A volunteer member of the senior rates mess takes individual meal orders and delivers the meals to the senior rates mess.

3.1.8.1.3 Both the junior and senior rates messes have sinks. The used table ware is cleaned by the respective messes' members.

3.1.8.2 Breakfast. The steward is responsible for preparing breakfast which is served from 0300 hours to 0400 hours. The steward starts at 0000 hours by taking the food required for breakfast from the food storage areas to the galley. The steward prepares the food so that breakfast is ready to be served by 0230 hours. The steward serves breakfast and puts aside the breakfast meals for the personnel who will not be present during the breakfast services (for example day workers). After the breakfast service, the steward cleans the galley. At 0500, the steward wakes the assigned cook for the next meal. A sample breakfast menu can be found below.

A	B	C	D	E	F	G	H
HMCS Windsor Standardized Cycle Menu							
Week 1							
BREAKFAST							
Main Menu	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Healthier Breakfast	Healthy Buddy	Healthy Buddy	Healthy Buddy	Healthy Buddy	Healthy Buddy	Healthy Buddy	Healthy Buddy
Heartier Breakfast	Bacon Buddy	Bacon Buddy	Bacon Buddy	Bacon Buddy	Bacon Buddy	Bacon Buddy	Bacon Buddy
Ala Carte	2 Eggs Cooked Any Style, Bacon Or Sausage, Breakast Potato	2 Eggs Cooked Any Style, Bacon Or Sausage, Breakast Potato	2 Eggs Cooked Any Style, Bacon Or Sausage, Breakast Potato	2 Eggs Cooked Any Style, Bacon Or Sausage, Breakast Potato	2 Eggs Cooked Any Style, Bacon Or Sausage, Breakast Potato	2 Eggs Cooked Any Style, Bacon Or Sausage, Breakast Potato	2 Eggs Cooked Any Style, Bacon Or Sausage, Breakast Potato
Breakfast Special	Breakfast Burrito	Fresh Made Waffles	Eggs Bennedict	Chocolate Chip Pancakes	Ham & Cheese Quesadilla	Smoked Salmon & Herb Cream Cheese Wrap	Breakfast Parfait
Standard Breakfast Items	Milk, Juice, Cereals, breads, yogurt, fruit, dried fruit, oatmeal, muffins, low fat muffins	Milk, Juice, Cereals, breads, yogurt, fruit, dried fruit, oatmeal, muffins, low fat muffins	Milk, Juice, Cereals, breads, yogurt, fruit, dried fruit, oatmeal, muffins, low fat muffins	Milk, Juice, Cereals, breads, yogurt, fruit, dried fruit, oatmeal, muffins, low fat muffins	Milk, Juice, Cereals, breads, yogurt, fruit, dried fruit, oatmeal, muffins, low fat muffins	Milk, Juice, Cereals, breads, yogurt, fruit, dried fruit, oatmeal, muffins, low fat muffins	Milk, Juice, Cereals, breads, yogurt, fruit, dried fruit, oatmeal, muffins, low fat muffins

3.1.8.3 Lunch. Either the chief cook or the junior cook prepares the lunch meal. The cook responsible for lunch collects the required ingredients from the food stowage areas. The cook serves lunch form 1100 hours until 1200 hours or until everyone is fed. The cook cleans the galley (takes about 30 minutes) and then goes on break. The other cook may assist in serving lunch and in cleaning the galley following the lunch service. A sample lunch menu can be found below.

Lunch							
Main Menu	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Soup	Harvest Vegetable	Cream Of Tomato	French Onion	Chicken Noodle	Seafood Chowder	Beef & Barley	Minestrone
Healthier Choice	Greek Salad W/Seasoned Chicken Breast	Grilled Prosciutto W/Summer Vegetables & Pesto	Spicy Tuna & Avacado Salad	Chicken Shawarma	Pan Seared Haddock	Braised Lamb W/Pan Gravy	Chicken Chili Wrap
Vegetarian/Vegan Choice (5-6 Portions)	Garden Chili	Kung Pao Tofu	Mexican Spiced Stuffed Peppers	Brocoli Cheddar Quiche	Quinoa Veggie Burger	Butter Bean Burger	Spicy Black Bean Burrito
Heartier Choice	Grilled Ham & Cheese	Octoberfest Sausage W/Sourkraught	Beef Soft Shell Tacos	Mac & Three Cheese	Turkey Loaf W/Creole Sauce	Donair	Tuna Melts
Starch	Basil and Roasted Veg Fusili Pasta	Cheddar Cheese Pergoies W/Onion & Bacon	Mexican Fried Rice	Herb Quinoa	Roast Potato Poutine	Basmati Rice	Cajun Roasted Potato Wedges
Vegetable	Canned Beets	Garden Salad	Bean Salad	Spinach Salad	Vegetable Tray	Coleslaw	Mustard Pickles
Meal Accompaniments		Sour Cream, Hummas, Garlic Sauce, Tabouli	Salsa, Cilantro Sour Cream, Re-fried Beans		Sliced Lemon, Tartar Sauce, Fresh Rolls	Donair Sauce, Cheese, Onion, Tomato	

3.1.8.4 Dinner. The cook who did not make lunch is responsible for dinner. As soon as the galley is cleaned up from lunch, the cook starts preparation for dinner. The cook collects the required ingredients from the food storage areas. The cook serves dinner from 1900 hours to 2000 hours or until

everyone is fed. The cook cleans the galley (takes about 60 minutes). A sample dinner menu can be found below.

Supper							
Main Menu	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Healthier Choice	Pan Seared Halibut	Honey Glazed Chicken Legs	Beef & Broccoli	Seared Cajun Shrimp	Moroccan Roasted Pork Loin	Roasted Unbreaded Chicken Wings	Pork Tenderloin W/Pan Sauce
Vegetarian/Vegan Choice (5-6 Portions)	Medterrian Tomato & Ricotta Pasta	Portabello Mushroom Caps	Vegetable Stir Fry	Cauliflower Steak	Sundried Tomato Hummas Cakes	Vegetarian Pizza	Yellow Thai Curry W/ Vegetable & Tofu
Heartier Choice	Chorizo Sausage & Peppers	Glazed Ham	Tandoori Chicken Breast	Beef Tenderloin	Cabbage Rolls (Beef) W/Tomato Sauce	Meat lovers Pizza & Breaded Chicken Wings	Seafood Tagliatelle Tomato Cream Pasta
Starch	Mushroom Rissotto	Scallop Potatoes	Briyani Style Rice	Roasted Baby Reds	Sweet Potato Mash	Bulgar (Small Amount)	Lynoise Potato
Vegetable	Asparugus & Tomato	Baby Carrots	PEI Mix Veg	Mushroom & Onion	Roasted Root Veg	Celery & Carrot Sticks	Winter Mix Veg
Meal Accompaniments	Balsamic Reduction, Shaved Parm	Honey Mustard	Cooked Yogurt Sauce for Chicken	Demi Glaze	Tangy Tomato Chutney	Wing Sauces, Ranch Dressing	Garlic Bread Sticks
Dessert	Apple Crisp	Cheesecake (Orded In)	Assorted Cookies (Ordered In)	Ice Cream	Brownie (Ordered In)	Lemon Square	Bread Pudding
MENUS ARE SUBJECT TO CHANGE WITH THE AVAILABILITY OF FOOD PRODUCT, SEA STATE CONDITIONS, AND OPERATIONAL COMMITMENTS.							
PO2 Mollins, Chief Cook		LOGO Signature:_____			CO Signature:_____		

3.1.8.5 Snack. After dinner, between the two cooks, a snack is prepared for the watch for 0000 hours. The snack is usually a pre-packaged item; however, sometimes the snack is freshly prepared. The cooks usually finish in the galley by 2200 hours. Snacks are also provided at 0800 hours and 1500 hours.

3.2 Required Modes and Sub-Modes

3.2.1 Each of the improved galley elements must have the required modes and sub-modes as identified in section 3.3 of their respective TSORs.

3.3 Functional Requirements

3.3.1 Each of the improved galley elements must meet the functional requirements as identified in section 3.4 of their respective TSORs.

3.4 External Interfaces

3.4.1 Each of the improved galley elements must meet the required external interfaces as identified in section 3.5 of their respective TSORs.

3.5 Safety Requirements

3.5.1.1 Personnel Safety

3.5.1.2 The improved galley must meet the safety requirements as identified and defined by the reference at Section 2 Applicable Documents Table 1 Item 16.

3.5.2 Material Safety

3.5.2.1 Each of the improved galley elements must be constructed of non-hazardous material as defined by the reference at Section 2 Applicable Documents, Table 1 Item 17.

3.5.3 Electrical Safety

3.5.3.1 The improved galley elements must meet the electrical safety requirements as defined by the reference at Section 2 Applicable Documents, Table 1 Item 14.

3.6 Quality Factors

3.6.1 Availability

3.6.1.1 Each improved galley element must be designed such that it must be available 95% of the time during a 49 day patrol period.

3.6.2 Mean Time Between Failure

3.6.2.1 The improved galley elements must be designed such that those elements which are subject to Repair by Replacement must have a minimum Mean Time Between Failure (MTBF) of not less than (8 months x 30days/month x 24 hrs. per day) 5760 hours.

3.6.3 Design Life

3.6.3.1 Each improved galley element must have a design life of 15 years.

3.7 Design and Construction Constraints

3.7.1 Functional Compatibility

3.7.1.1 Each improved galley element must be functionally compatible with the unit it is replacing as identified in Section 3.7.1 of their respective TSORs.

3.7.2 Form Compatibility

3.7.2.1 Each improved galley element must be form compatible with the unit it is replacing as identified in Section 3.7.2 of their respective TSORs.

3.7.3 Fit Compatibility

3.7.3.1 Each improved galley element must be fit compatible with the unit it is replacing as identified in Section 3.7.3 of their respective TSORs.

3.7.4 Weight Compatibility

3.7.4.1 Each improved galley element must be weight compatible with the unit it is replacing as identified in Section 3.7.4 of their respective TSORs.

3.7.5 Modular Design

3.7.5.1 Each improved galley element must be of modular design with a minimum number of lowest replaceable unit modules or components.

3.7.6 Material

3.7.6.1 The improved galley elements must be constructed of commercial kitchen grade materials.

3.7.7 Paint

3.7.7.1 The improved galley elements, if painted, must be painted in accordance with the reference at Section 2 Applicable Documents, Table 1 item 5.

3.8 Environmental Requirements

3.8.1 It is recognized that the improved galley elements will be COTs or COTS with modified packaging.

3.8.2 Notwithstanding, the improved galley elements must be secured in a manner such that they meet the Shock Requirements of Tables 3 and 4 below.

Item	Environmental Condition	Requirements	Standard (reference) and Comments
1	Shock	As Grade 3 equipment, the only requirement is that the equipment does not become a projectile and injure personnel or other equipment during shock events. Derived Parameters	D-03-003-007 SG000 Specification For Design And Test Criteria For Shock Resistant Equipment In Naval Ships

Item	Environmental Condition	Requirements	Standard (reference) and Comments
		Shock Grade G, see table 4 below this table.	BR3021(1) Shock Manual

Table 3: Environmental Requirements

Shock Grade	Direction	Effective Acceleration A ms^2	Effective Deceleration D ms^2	Max Absolute Displacement S mm	Duration of Initial Pulse T_3 msec
G	Vertical	811	442	81	24
	Athwartship	541	264	57	26

Table 4: BR3021 (1) Derived Parameters Shock Grade G

3.8.3 Ships Motion

3.8.3.1 General

3.8.3.1.1 It is recognized that the improved galley elements will be COTs or COTS with modified packaging.

3.8.3.1.2 Notwithstanding, the improved galley elements must be secured in a manner such that they operate correctly under the following conditions of ship's motion.

3.8.3.2 Submerged

3.8.3.2.1 Heel
40 degrees for 5 seconds duration
20 degrees for 20 seconds duration
10 degrees continuously

3.8.3.2.2 Trim
30 degrees for 30 seconds duration
22 degrees for 3 minutes duration
15 degrees continuously

3.8.3.2.3 Combined
+/- 30 degrees trim/ 10 degrees heel for 30 seconds duration
+/- 15 degrees trim/ 40 degrees heel for 5 seconds duration

3.8.3.3 Surfaced

3.8.3.3.1 Heel 10 degrees continuously

3.8.3.3.2 Trim 5 degrees continuously

3.8.3.3.3 Roll +/- 30 degrees 6 second period for a full cycle

3.8.3.3.4 Pitch +/- 2.5 degrees 5 second period for a full cycle

3.9 Installation

3.9.1 The improved galley elements must comply with the installation requirements in accordance with DefStan 08-160.

3.10 Human Factors

3.10.1 Operations, Maintenance and Support

3.10.1.1 The improved galley elements must meet the human factor requirements for operations maintenance and support in accordance with DefStan 00-250 Part 3 Section 12 Operations, Maintenance and Support.

3.10.2 Installation, Removal and Maintenance

3.10.2.1 The improved galley elements must meet the requirements for installation, removal and maintenance in accordance with DefStan 00-250 Part 3 Section 9 People Characteristics.

3.11 Maintenance

3.11.1 General

3.11.1.1 Maintenance to be carried out on the improved galley elements components will be classified as Preventive Maintenance (PM), Corrective Maintenance (CM) or Major Maintenance including Repair and Overhaul (R&O).

3.11.1.2 Staff carrying out maintenance will be from the mechanical discipline.

3.11.2 Preventive Maintenance

3.11.2.1 PM is periodic maintenance carried out on a component to ensure its availability (e.g. cleaning of filters, lubrication of moving parts, etc.).

3.11.2.1.1 The staff carrying out PM may be a trainee or an apprentice under the supervision of a journeyman, or a journeyman.

3.11.2.1.2 PM is classified as Minor or Major depending on frequency. Minor is that PM that is carried out with a frequency of less than 4 months. Major PM is that PM carried out at a frequency of 4 months or greater.

3.11.2.1.3 Minor PM is carried out by ship's staff.

3.11.2.1.4 Major PM may be carried out by ship's staff or the Fleet Maintenance Facility (FMF) staff.

3.11.3 Corrective Maintenance

3.11.3.1 The improved galley elements (where applicable) must have Built-In-Test (BIT) ability to isolate faults to the Lowest Replaceable Unit (LRU). The LRU is the lowest level of system component that has been spared. LRUs may include consumables (e.g. bulbs, fuses, filters, etc.).

3.11.3.2 Corrective Maintenance (CM) may be carried out by ship's staff or FMF staff.

3.11.3.3 The staff carrying out CM will be from the electrical discipline. The staff may be a trainee or an apprentice under the supervision of a journeyman, or a journeyman.

3.11.3.4 CM must be completed through Repair by Replacement (RxR) of the LRU. Failed LRUs are will be replaced with spare LRUs drawn from ship's or depot level stores.

3.11.3.5 Ship's or depot level store will Maintain by Exchange (MxE) failed non-consumable failed LRUs through exchanging them for a working LRU from the next stores level (ships with depot, depot with Original Equipment Manufacturer (OEM)-the OEM will repair the LRU and return it to depot). In the case where the LRU is a consumable, there may be no exchange, just a spares demand for the consumable LRU.

3.11.3.6 The improved galley elements must be designed such that those LRUs which are subject to Repair by Replacement must have a maximum Mean Time to Repair (MTTR) of not more than 24 hours using specified procedures and resources. MTTR time must include time to isolate, remove the faulty LRU and bring it back on-line and it must not include time taken to obtain the replacement LRU.

3.11.4 Major Maintenance

3.11.4.1 Any required improved galley element major maintenance must occur during a scheduled ID and take no longer than four months to complete.

3.11.4.2 Repair and Overhaul

3.11.4.2.1 Any required improved galley element Repair and Overhaul (R&O) must occur during a scheduled EDWP and take no longer than one year to complete.

APPENDIX 1

TECHNICAL STATEMENT OF REQUIREMENT

GALLEY IMPROVEMENT - RANGE

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

NOTICE

This documentation has been reviewed by the technical authority and does not contain controlled goods. Disclosure notices and handling instructions originally received with the document must continue to apply.

AVIS

Cette documentation a été révisée par l'autorité technique et ne contient pas de marchandises contrôlées. Les avis de divulgation et les instructions de manutention reçues originalement doivent continuer de s'appliquer.

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LIST OF EFFECTIVE PAGES

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Page No.	**Change No.**
All	**Original**

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The range quantity (1) in number is a component of the Victoria Class Submarine Improved Galley.

1.1.2 System Overview.

1.1.2.1 The improved galley range replaces the current Gastronorm galley range and its control panel (see figures 1 and 2 below). The current galley range includes a foldable range cover, four hotplates, two ovens and two hot cupboards and associated controls for the ovens and hotplates. When the hotplates are not in use, the foldable range cover is down and can be used as a food preparation surface. When the hotplates are in use, the cover is up.

1.1.2.2 The hotplates are used for frying, boiling water, making the daily soup, sauces, searing and sometimes to reheat the food for serving the meal.

1.1.2.3 Each hotplate has a 1.5 kiloWatt (kW), 440 Volt (V) heating element.

1.1.2.4 The temperature for each hotplate is controlled from the control panel. Each hotplate has a four position switch with an off, low, medium and high position.

1.1.2.5 The hot cupboards are used for keeping prepared food hot.

1.1.2.6 The ovens are used for baking, roasting, and reheating the food for serving the meal.

1.1.2.7 Each oven has six 500 Watt (W), 440 V heating elements.

1.1.2.8 The power for each oven is controlled from the control panel. Each oven has a four position switch with off and on positions.

1.1.2.9 The temperature of each oven, when the oven is on, is controlled by the oven thermostat rotary control located to the top right of the oven door.

1.1.2.10 The oven temperature control range is +60 to +260 degrees Centigrade (C) with a mean temperature tolerance of +/-10 degrees C of the thermostat setting.

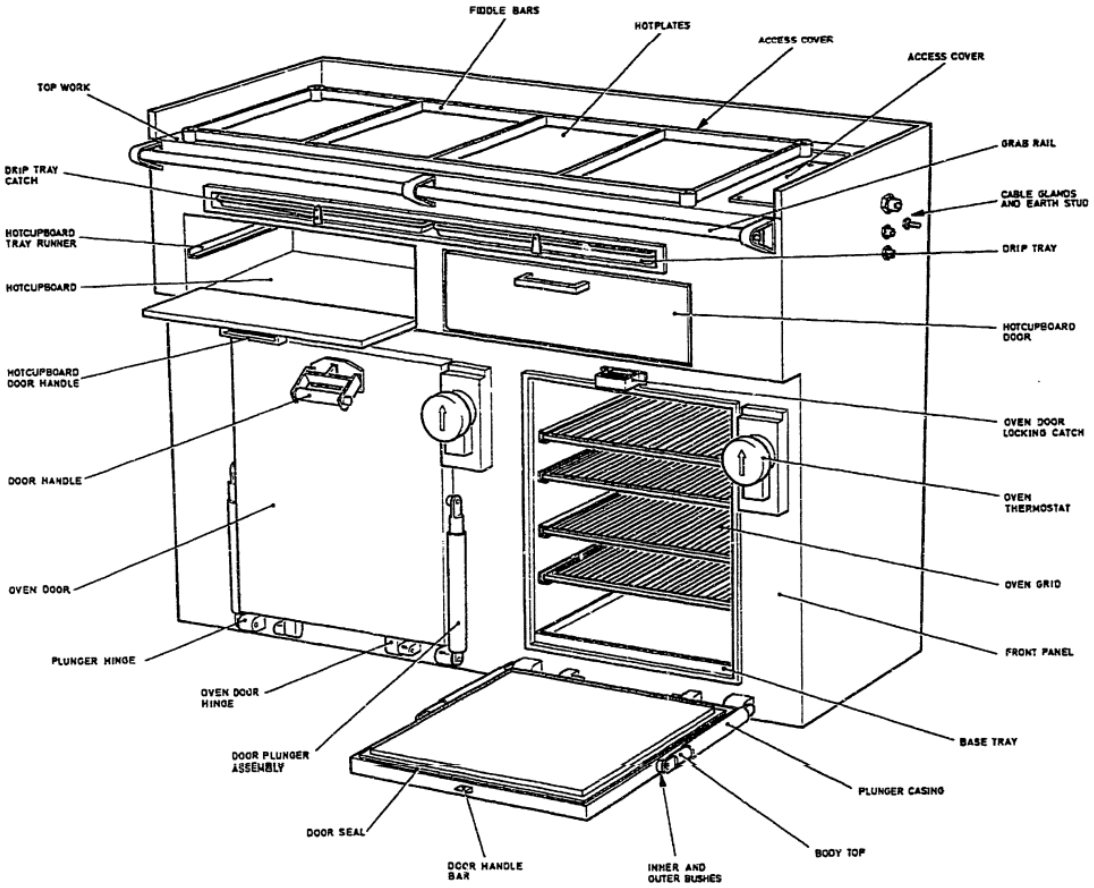

Figure 1-Current Galley Range

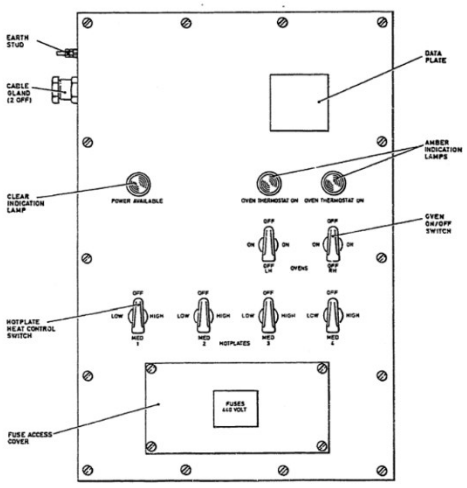

Figure 2-Current Galley Range Control Panel

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1.	BRF 1966(25)01	Galley Range

2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	Document	Title
		No Non-Government Documents

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

Specification Caveats:

a. This specification represents the current galley design, which has a single range including four hot plates, two hot cupboards and two ovens all in a single unit. It is recognized that the improved galley design may provide this functionality across several COTS appliances. Whatever the combination of COTS appliances, they must fit within the current range's envelope and any envelope made available by the removal of the deep fat fryer.

b. The inside dimensions of the ovens, hot cupboards and the surface dimensions of the hot plates are based on Gastronorm standard pans. Should the contractor recommend appliances that use a different standard, this is to be identified.

c. Whatever standard is identified, it must be consistent across the range, servery, and any associated hot cupboards.

3 SYSTEM REQUIREMENTS

3.1 General

3.1.1 Common requirements across all improved galley components (excluding pots, pans and utensils) are contained in Annex B TSOR Common. Unique requirements to the range are contained in this TSOR.

3.2 Required States and Modes

3.2.1 Range Cover. The range cover has two states: open and closed.

3.2.1.1 Range Cover Open. When the range cover is open, it is locked in the open position and self-supported so that the user has access to the hotplates below.

3.2.1.2 Range Cover Closed. When the range cover is closed, it is locked in the closed position and can be used as a counter for food preparation.

3.2.2 Hot Plates. A hot plate has two states: off and on. When on it has adjustable temperature modes.

3.2.2.1 Hot Plate Off. When the hot plate is off no current flows through the hot plate element and the element does not generate any heat.

3.2.2.2 Hot Plate On. When the hot plate is on, an adjustable current flows through the hot plate element and heat is generated. The amount of heat generated depends on the adjustable current.

3.2.2.3 When on, as a minimum the current must be adjustable to a low, medium, or high mode.

3.2.3 Ovens. An oven has four states: off, on, timed on and off, and self-clean.

3.2.3.1 Oven Off. When the oven is in the off state no current flows through the oven elements and the elements do not generate any heat.

3.2.3.2 Oven On. When the oven is in the on state, it heats to the pre-set temperature, and maintains that temperature until it is turned off.

3.2.3.3 Oven Timed On And Off. When the oven is in the timed on and off state, it heats to the pre-set temperature at the pre-set on time, maintains that temperature until the pre-set off time, and then shuts off at the pre-set off time.

3.2.3.4 Oven Self Clean. When the oven is in the self-clean state, it heats to the self-cleaning temperature for the set self-cleaning period, and then shuts off once the self-cleaning period is over.

3.3 Functional Requirements

3.3.1 Oven Functional Requirements

3.3.1.1 The range must include 2 ovens.

3.3.1.2 Each oven must be provided with sufficient heating element capacity to be able to broil, bake, reheat and self-clean.

3.3.1.3 Each oven must have a separate temperature control system.

3.3.1.4 The control for the temperature control system must be mounted on the top range front.

3.3.1.5 When in regular use, the temperature must be controllable from +60 to +260 degrees C with as a minimum a mean temperature tolerance of +/-10 degrees C of the thermostat setting.

3.3.1.6 When in self clean, the oven must heat to +500 degrees C for the recommended amount of self-clean time.

3.3.1.7 Each oven must have an insulated door hinged at the bottom.

3.3.1.8 The door must be safe to open in an outward and downward direction.

3.3.1.9 The door must have a handle at the top which locks the door positively in the closed position.

3.3.1.10 Each oven must have a fume outlet duct routed from the top of the oven.

3.3.1.11 Each oven must have runners for removable oven grids, secured to the right and left inner oven walls at different levels in the oven.

3.3.1.12 Each oven, as a minimum, must have the following internal dimensions: 480 millimeters (mm) high x 350mm wide by 300mm deep.

3.3.1.13 Each oven must have a base tray located in the base of the oven.

3.3.2 Hot Cupboard Functional Requirements

3.3.2.1 The solution must include 2 hot cupboards.

3.3.2.2 Each hot cupboard must be centrally arranged between the top of an oven and the hotplates. Note: The improved range must have hot cupboards but not necessarily in this arrangement. A separate hot cupboard will be acceptable.

3.3.2.3 Each hot cupboard, as a minimum, must have the following internal dimensions: 160mm high x 440mm wide x 330 mm deep.

3.3.2.4 Each hot cupboard must have a hinged downward opening stainless steel door fitted with an insulated handle.

3.3.2.5 Each hot cupboard must have a runner for a removable tray, secured to the right and left inner hot cupboard walls.

3.3.3 Hotplates

3.3.3.1 The range must include four hotplates.

3.3.3.2 The hotplates must be located above the hot cupboards and extend from the left of the range’s work top to right side of the range.

3.3.3.3 Each hot plate must be provided with sufficient heating element capacity to be able to fry, boil water, sear and reheat.

3.3.3.4 Each hot plate must have a separate temperature control system.

3.3.3.5 The control for the temperature control system must be mounted on the top range front.

3.3.3.6 Each hot plate must be mounted to the range in such a manner that it can be levelled as required.

3.3.3.7 Each hot plate must have a drip tray below it. This drip tray may be individual or in pairs.

3.3.3.8 Each hot plate must be able to bring a 16 liter pot of water to boil in 20 minutes or less.

3.3.3.8.1 Each hot plate, as a minimum, must have the following dimensions: 310mm x 210mm. Note: The improved galley hot plates may have different dimensions provided they meet the heating requirements.

3.3.4 Grab Rail

3.3.4.1 The range must have a grab rail at the top of the front panel.

3.4 External Interfaces

3.4.1 The range has the following external interfaces: electrical and mechanical.

3.4.1.1 Electrical Interfaces. The range must interface directly with the submarine's 440 Volt (V) 60 Hertz (Hz) three phase power.

3.4.1.2 Mechanical Interfaces. The ranges must interface directly with the submarine's structure via mounting arrangements which meet shock qualification requirements.

3.5 Safety Requirements

3.5.1 Personnel Safety

3.5.1.1 The range must meet the personnel safety requirements as identified Annex B TSOR Common Section 3.5.1.

3.5.2 Material Safety

3.5.2.1 The range must meet the material safety requirements as identified in Annex B TSOR Common Section 3.5.2.

3.5.3 Electrical Safety

3.5.3.1 The range must meet the electrical safety requirements as identified in Annex B TSOR Common Section 3.5.3.

3.6 Quality Factors

3.6.1 Availability

3.6.1.1 The range must be designed such that it meets the availability requirements as identified in Annex B TSOR Common Section 3.6.1.

3.6.2 Mean Time Between Failure

3.6.2.1 The range must meet the mean time between failure requirements as identified in Annex B TSOR Common Section 3.6.2.

3.6.3 Design Life

3.6.3.1 The range must meet the design life requirements identified in Annex B TSOR Common Section 3.6.2.

3.7 Design and Construction Constraints

3.7.1 Functional Compatibility

3.7.1.1 The range must be functionally compatible, as described in Section 3.2 above, with the unit it is replacing.

3.7.2 Form Compatibility

3.7.2.1 The ranges form (outside dimensions) must as a minimum equal the outside dimensions of the unit it is replacing, which are 915mm high x 1180mm wide x550mm deep.

3.7.2.2 Depending on the selected range, and the designer’s intent with the space that is freed up by removing the deep fat fryer, the width of the range may exceed the existing width up to the amount of space freed up by the removal of the deep fat fryer.

3.7.3 Fit Compatibility

3.7.3.1 The range must be fit compatible with the unit it is replacing.

3.7.3.1.1 Electrical Fit. The range’s electrical connections must connect directly to the submarine’s 440 V three phase electrical circuits, external to the range, without modifications to these circuits.

3.7.3.1.2 Electrical Load Balancing. The ranges heating elements must be evenly balanced across the 440 V 3 phase electrical circuits.

3.7.3.1.3 Electrical Power Consumption. The range must not consume more power than the unit it is replacing which in kW is 12kW.

3.7.3.1.4 Mechanical Fit. The range's mechanical interface with the existing submarine mounting arrangements must connect directly to these mounting arrangements without modifications to the mounting arrangements.

3.7.4 Weight Compatibility

3.7.4.1 The range must not weigh more than the weight of the unit it is replacing which in kilograms (kg) is 760 kg.

3.7.5 Modular Design

3.7.5.1 The range must be of modular design with, to the maximum extent possible, a minimum number of line replaceable unit modules or module components.

3.7.6 Material

3.7.6.1 The range must meet the material requirements as identified in Annex B TSOR Common Section 3.7.6.

3.7.7 Paint

3.7.7.1 The range must meet the paint requirements as identified in Annex B TSOR Common Section 3.7.7.

3.8 Environmental Requirements

3.8.1 The range must meet the environmental requirements identified in Annex B TSOR Common Section 3.8.

3.9 Installation Requirements

3.9.1 The range must meet the installation requirements identified in Annex B TSOR Common Section 3.9.

3.10 Maintenance Requirements

3.10.1 The range must meet the maintenance requirements as identified in Annex B TSOR Common Section 3.10.

APPENDIX 2

TECHNICAL STATEMENT OF REQUIREMENT

GALLEY IMPROVEMENT – SERVERY COUNTER

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

NOTICE

This documentation has been reviewed by the technical authority and does not contain controlled goods. Disclosure notices and handling instructions originally received with the document must continue to apply.

AVIS

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Page No.	**Change No.**
All	**Original**

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The servery counter quantity (1) in number is a component of the Victoria Class Submarine Improved Galley.

1.1.2 System Overview.

1.1.2.1 The improved galley servery counter replaces the current galley Gastronorm servery counter (see figure 1 below). The current galley servery counter is a 4-dish, 2/3 size pan set up that comprises an electrically heated, open top, dry heat display counter for food dishes, beneath which are three hot cupboards fitted with sliding doors.

1.1.2.2 The servery counter is to store cooked food at the correct temperature and provide a heated area for previously cooked foods to remain warm until serving the meal.

1.1.2.3 The temperature for the food dish wells and the hot cupboards is controlled from the control panel on the left of the unit.

1.1.2.4 The open top dry heat display counter has six heating elements arranged across the width of the unit.

1.1.2.5 Each heating element has a rating of 250 Watt (W), 440 Volts.

1.1.2.6 The lower part houses three hot cupboards arranged in separate compartments each with their own heating element.

1.1.2.7 Each heating element has a rating of 250 W, 440 V.

1.1.2.8 The servery counter has two 2-heat control switches, one for the six upper elements and one for the three lower elements. The switches are tallied OFF/LOW/OFF/HIGH.

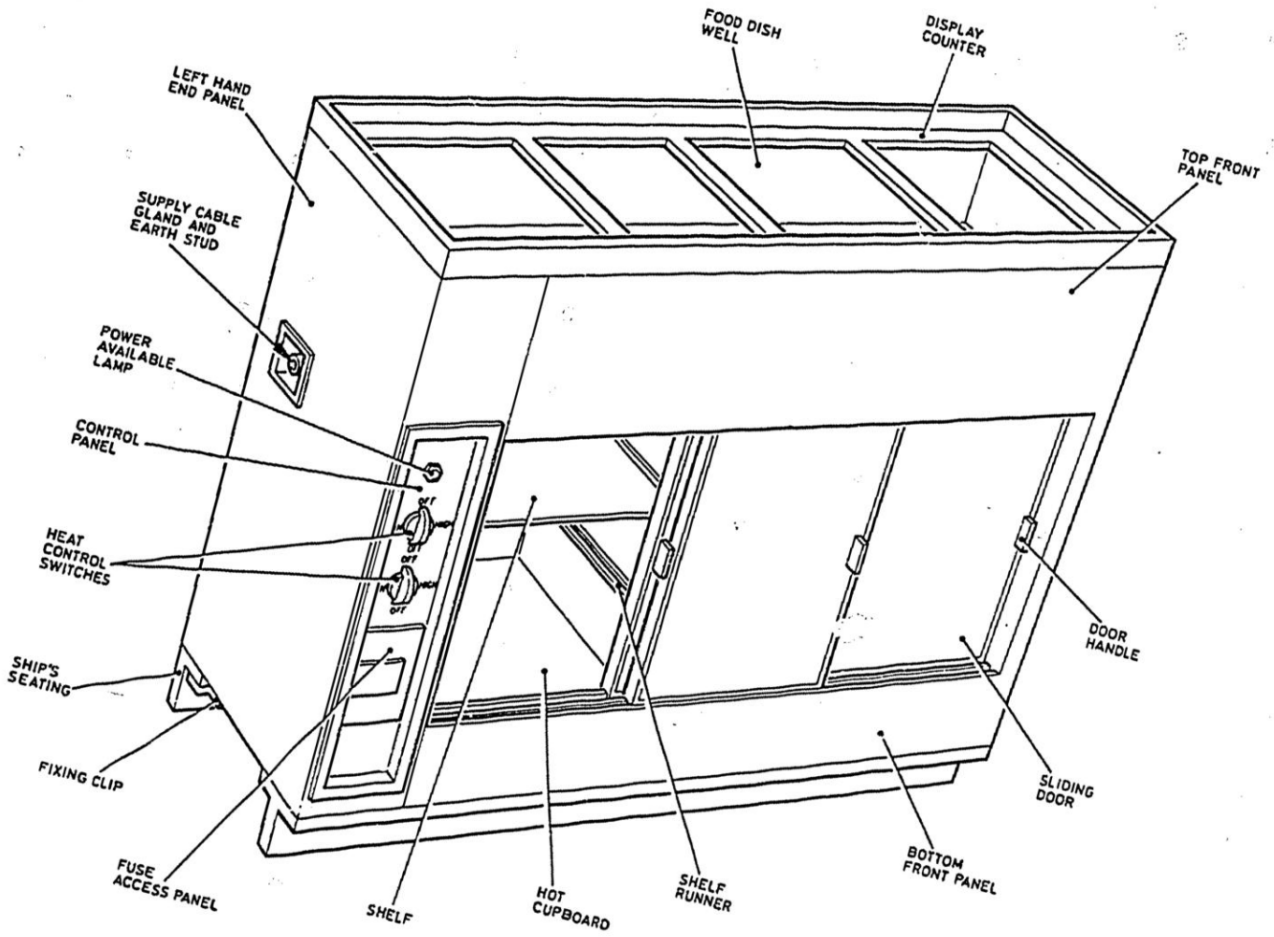

Figure 1-Current Galley Servery Counter

Figure 2 – Photos of Current Galley Servery Counter

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1.	BRF 1966 (25) 05	Gastronorm Servery Counter

2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	**Standard**	**Title**
1.		No Non-Government Documents

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

Specification Caveats:

a. This specification represents the current galley design, which has a servery counter that comprises an electrically heated, open top, dry heat display counter for food dishes, beneath which are three hot cupboards fitted with sliding doors. It is recognized that the improved galley design may provide this functionality with COTS appliances. Whatever the combination of COTS appliances, they must fit within the current servery counter envelope.

b. The inside dimensions of the servery counter and hot cupboards and the surface dimensions of the heated wells are based on Gastronorm standard pans. Should the contractor recommend appliances that use a different standard, this is to be identified.

3 SYSTEM REQUIREMENTS

3.1 General

3.1.1 Common requirements across all improved galley components (excluding pots, pans and utensils) are contained in Annex B TSOR Common. Unique requirements to the servery counter are contained in this TSOR.

3.2 Required States and Modes

3.2.1 Servery Counter Cover. The servery counter cover has two states: on and off.

3.2.1.1 Servery Counter Cover On. When the counter cover is on, it is secured in place and can be used as a counter for food preparation.

3.2.1.2 Servery Counter Cover Off. When the cover is off, the heat dish wells are exposed, and they can be used for serving pre-prepared food.

3.2.2 Heated Dish Well. The heated dish well has two states: off and on. When on it has adjustable temperature control modes.

3.2.2.1 Heated Dish Well Off. When the heated dish well is off no current flows to its six elements and the elements do not generate any heat.

3.2.2.2 Heated Dish Well On. When the heated dish well is on, an adjustable current flows through to the heated dish well elements and heat is generated. The amount of heat generated depends on the adjustable current.

3.2.2.3 When on, the current is adjustable to, as a minimum, a low or high mode.

3.2.3 Hot Cupboards. A hot cupboard has two states: off and on.

3.2.3.1 Hot Cupboard Off. When the hot cupboard is off, no current flows to its element and the element does not generate any heat.

3.2.3.2 Hot Cupboard On. When the hot cupboard is on, an adjustable current flows through to the hot cupboard's element and heat is generated. The amount of heat depends on the adjustable current.

3.2.3.3 When on, the current is adjustable, as a minimum, to a low or high mode.

3.3 Functional Requirements

3.3.1 Food Dish Well Requirements

3.3.1.1 The servery counter includes four food dish wells

3.3.1.2 The food dish wells must be located above the hot cupboards and extend from the left of the counter's topwork to the right side of the counter.

3.3.1.3 Each food dish well must be provided with sufficient heating capacity to be able to maintain the food to be served at the correct temperature.

3.3.1.4 Each food dish well must have a separate temperature control system.

3.3.1.5 The control for the temperature control system must be mounted on the front of the servery counter.

3.3.1.6 The food dish well, as a minimum must have the following dimensions: 1290 mm wide x 355 mm deep x 141 mm high and can accommodate four Gastronorm 2/3 pans. Note: The improved galley food dish well may have different dimensions provided they meet the capacity and heating requirements.

3.3.2 Hot Cupboard Requirements

3.3.2.1 The servery counter must include 3 hot cupboards.

3.3.2.2 The hot cupboards must be located below the food dish wells.

3.3.2.3 Each hot cupboard must be provided with sufficient heating capacity to be able to maintain the food to be served at the correct temperature.

3.3.2.4 Each hot cupboard must have a separate temperature control system.

3.3.2.5 The control for the temperature control system must be mounted on the front of the servery counter.

3.3.2.6 The inner body dimensions of the existing hot cupboards are: 1117 mm wide x 490 mm high x 376 mm deep. The existing dry heat well is: 1290 mm wide, 355mm deep and 141 mm high.

Note the improved galley hot cupboards and dry heat well may have different dimensions provided they fit the existing space, and meet the capacity and heating requirements.

3.3.2.7 Each hot cupboard must have runners for removable trays, secured to the right and the left inner hot cupboard walls.

3.3.2.8 The doors to the hot cupboards must be of the sliding variety, and must be insulated.

3.4 External Interfaces

3.4.1 The servery counter has the following external interfaces: electrical and mechanical.

3.4.1.1 Electrical interfaces. The servery counter must interface directly with the submarine's 440 V 60 Hertz (Hz) three phase power.

3.4.1.2 Mechanical Interfaces. The servery counter must interface directly with the submarine's structure via mounting arrangements which meet shock qualification requirements.

3.5 Safety Requirements

3.5.1 Personnel Safety

3.5.1.1 The servery counter must meet the personnel safety requirements as identified Annex B TSOR Common Section 3.5.1.

3.5.2 Material Safety

3.5.2.1 The servery counter must meet the material safety requirements as identified in Annex B TSOR Common Section 3.5.2.

3.5.3 Electrical Safety

3.5.3.1 The servery counter must meet the electrical safety requirements as identified in Annex B TSOR Common Section 3.5.3.

3.6 Quality Factors

3.6.1 Availability

3.6.1.1 The servery counter must it meet the Availability requirements as identified in Annex B TSOR Common Section 3.6.1.

3.6.2 Mean Time Between Failure

3.6.2.1 The servery counter must meet the Mean Time Between Failure requirements as identified in Annex B TSOR Common Section 3.6.2

3.6.3 Design Life

3.6.3.1 The servery counter must meet the Design Life requirements as identified in Annex B TSOR Common Section 3.6.3.

3.7 Design and Construction Constraints

3.7.1 Functional Compatibility

3.7.1.1 The servery counter must be functionally compatible, as described in Section 3.2 above, with the unit it is replacing.

3.7.2 Form Compatibility

3.7.2.1 The servery counter form (outside dimensions) must as a minimum, be equal to and not exceed the outside dimensions of the unit it is replacing, which are 1400 mm wide by 472 mm deep by 915 mm high.

3.7.3 Fit Compatibility

3.7.3.1 The servery counter must be fit compatible with the unit it is replacing.

3.7.3.1.1 Electrical Fit. The servery counter's electrical connections must connect directly to the submarine's 440 V, 3 phase 60 Hz electrical circuits, external to the servery counter, without modifications to these circuits.

3.7.3.1.2 Electrical Load Balancing. The servery counter's heating elements must be evenly balanced across the 440 V 3 phase 60 Hz electrical circuits.

3.7.3.1.3 Electrical Power Consumption. The servery counter must not consume more power than the unit it is replacing which in kW is 2.25kW.

3.7.3.1.4 Mechanical Fit. The servery counter's mechanical interface with the existing submarine mounting arrangements must connect directly to these mounting arrangements without modifications to the mounting arrangements.

3.7.4 Weight Compatibility

3.7.4.1 The servery counter must not weigh more than the weight of the unit it is replacing which in kilograms (kg) is 285 kg.

3.7.5 Modular Design

3.7.5.1 The servery counter must be of modular design with, to the maximum extent possible, a minimum number of line replaceable unit modules or module components.

3.7.6 Material

3.7.6.1 The servery counter must meet the material requirements as identified in Annex B TSOR Common Section 3.7.6.

3.7.7 Paint

3.7.7.1 The servery counter must meet the paint requirements as identified in Annex B TSOR Common Section 3.7.7.

3.8 Environmental Requirements

3.8.1 The servery counter must meet the Environmental Requirements identified in Annex B TSOR Common Section 3.8.

3.9 Installation Requirements

3.9.1 The servery counter must meet the Installation Requirements identified in Annex B TSOR Common Section 3.9.

3.10 Maintenance Requirements

3.10.1 The servery counter must meet the maintenance requirements as identified in Annex B TSOR Common Section 3.10.

APPENDIX 3

TECHNICAL STATEMENT OF REQUIREMENT

GALLEY IMPROVEMENT – REFRIGERATOR

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

NOTICE

This documentation has been reviewed by the technical authority and does not contain controlled goods. Disclosure notices and handling instructions originally received with the document must continue to apply.

AVIS

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The under counter refrigerator (referred to as galley refrigerator) quantity (1) in number is a component of the Victoria Class Submarine Improved Galley.

1.1.2 System Overview.

1.1.2.1 The improved galley refrigerator replaces the current galley refrigerator that has a door and shelves where still fitted. The improved refrigerator must have pull out drawers such as the one installed on HMCS WINDSOR (Figure 1 below).

1.1.2.2 The upper pull-out drawer is used to store items the crew can access, for example condiments. The lower pull-out drawer is used to temporarily store prep items, for example open sauce bottles, or unused peeled and cleaned vegetables.

1.1.2.3 The purpose of the galley refrigerator is to keep leftover food, and condiments cool.

1.1.2.4 The galley refrigerator is not used by the cooks during meal preparation.

Figure 1 – Refrigerator on HMCS WINDSOR

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1.		No Government Documents

2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	Document	Title
1.	Perlick Form No. HP24R-3 Rev. 09.06.2017	24” Signature Series Refrigerator

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

3 SYSTEM REQUIREMENTS

3.1 General

3.1.1 Common requirements across all improved galley components (excluding pots, pans and utensils) are contained in Annex B TSOR Common. Unique requirements to the refrigerator are contained in this TSOR.

3.1.2 Use

3.1.2.1 The galley refrigerator must meet the use requirements identified in Annex B TSOR Common Section 3.1.2.

3.2 Required States

3.2.1 The galley refrigerator has two states: off and on.

3.2.1.1 When off, no current flows to galley refrigerator.

3.2.1.2 When on, current flows to the galley refrigerator, and the refrigerator's temperature is controlled by a temperature control knob.

3.3 Functional Requirements

3.3.1 The galley refrigerator must include controls and indicators, two food storage drawers with integrated baskets and drawer illumination and drawer securing mechanisms.

3.3.1.1 Controls and Indicator

3.3.1.1.1 The galley refrigerator must have an on/off switch, a temperature control switch, and an indicator light.

3.3.1.1.2 On/Off Switch. The on/off switch provides power to refrigerator.

3.3.1.1.3 Temperature Control Switch. The temperature control switch controls the temperature at which the food stored in the refrigerator is kept. This switch may be integrated with the on/off switch.

3.3.1.1.4 Indicator Light. The indicator light indicates that the power is on to the refrigerator and that it is at the commanded temperature.

3.3.1.2 Food Storage Drawer

3.3.1.2.1 The food storage drawers must be similar in size and be located one on top of the other.

3.3.1.2.2 A food storage drawer must slide out and be self-supporting and remain positively retained in the sliding mechanism.

3.3.1.2.3 A food storage drawer must be able to be removed for cleaning.

3.3.1.2.4 A food storage drawer must include an integrated food basket.

3.3.1.3 Food Storage Drawer Illumination

3.3.1.3.1 Each food storage drawer must be separately lit when open.

3.3.1.4 Drawer Securing Mechanism

3.3.1.4.1 Each food storage drawer must be positively secured against ship motion by a positive drawer securing mechanism.

3.3.1.4.2 This mechanism may be integral to the drawer or may be part of the cabinetry into which the refrigerator fits.

3.4 Galley Refrigerator External Interfaces

3.4.1 The galley refrigerator has the following external interfaces: electrical, and mechanical.

3.4.1.1 Electrical Interface. The galley refrigerator must interface directly with the submarine's 120 V 60 HZ electrical system via a cord and a plug.

3.4.1.2 Mechanical Interfaces.

3.4.1.3 The galley refrigerator must interface directly with the galley counter and be mounted properly to meet shock qualification requirements.

3.5 Safety Requirements

3.5.1 Personnel Safety

3.5.1.1 The galley refrigerator must meet the personnel safety requirements identified in Annex B TSOR Common Section 3.5.1.

3.5.2 Material Safety

3.5.2.1 The galley refrigerator must meet the material safety requirements identified in Annex B TSOR Common Section 3.5.2.

3.5.3 Electrical Safety

3.5.3.1 The galley refrigerator must meet the electrical safety requirements identified in Annex B TSOR Common Section 3.5.3.

3.6 Quality Factors

3.6.1 Availability

3.6.1.1 The galley refrigerator must meet the availability requirements identified in Annex B TSOR Common Section 3.6.1.

3.6.2 Mean Time Between Failure

3.6.2.1 The galley refrigerator must meet the mean time between failure requirements as identified in Annex B TSOR Common Section 3.6.2.

3.6.3 Design Life

3.6.3.1 The galley refrigerator must meet the design life requirements as identified in Annex B TSOR Common Section 3.6.4.

3.7 Design and Construction Constraints

3.7.1 Functional Compatibility

3.7.1.1 The galley refrigerator must be functionally compatible, as describe in Section 3.2 above, with the unit it is replacing.

3.7.2 Form Compatibility

3.7.2.1 The refrigerator form (outside dimensions) must as a minimum equal the outside dimensions of the unit it is replacing, which are 899.6 millimeters (mm) high x 606.4 mm wide x 609.6 mm deep.

3.7.3 Fit Compatibility

3.7.3.1 The galley refrigerator must be fit compatible with the unit that it is replacing.

3.7.3.1.1 Electrical Fit. The galley refrigerator's electrical connections must connect directly to the electrical circuits, external to the galley refrigerator, without modifications to these circuits. The current refrigerator is powered by 115 Volts (V), 1 phase, 60 Hertz (Hz).

3.7.3.1.2 Electrical Power Consumption. The galley refrigerator must not consume more power than the unit it is replacing which is 290 kWh/yr.

3.7.3.1.3 Mechanical Fit. The galley refrigerator's mechanical interface with the existing submarine mounting arrangements must connect directly to these mounting arrangements without modifications to the mounting arrangements.

3.7.4 Weight Compatibility

3.7.4.1 The galley refrigerator must not weigh more than the weight of the unit it is replacing which in kilograms (kg) is 68.04 kilograms (kg).

3.7.5 Modular Design

3.7.5.1 The galley refrigerator must be of modular design to the maximum extent possible, as identified in Annex B TSOR Common Section 3.7.5.

3.7.6 Material

3.7.6.1 The galley refrigerator may be made of approved commercial off the shelf (COTS) material.

3.7.7 Paint

3.7.7.1 If painted, the galley refrigerator may retain its original COTS paint scheme.

3.8 Environmental Requirements

3.8.1 The refrigerator must be secured against the shock and vibration requirements identified in Annex B TSOR Common Section 3.8. The galley refrigerator must meet COTS environmental requirements.

3.9 Installation Requirements

3.9.1 The galley refrigerator must meet the installation requirements identified in Annex B TSOR Common Section 3.9

3.10 Human Factors

3.10.1 The galley refrigerator must meet the human factors requirements identified in Annex B TSOR Common Section 3.10.

3.11 Galley Refrigerator Maintenance Requirements

3.11.1 The galley refrigerator must meet the maintenance requirements as identified in Annex B TSOR Common Section 3.11.

APPENDIX 4

TECHNICAL STATEMENT OF REQUIREMENT

GALLEY IMPROVEMENT – CHILLED WATER DISPENSER

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

NOTICE

This documentation has been reviewed by the technical authority and does not contain controlled goods. Disclosure notices and handling instructions originally received with the document must continue to apply.

AVIS

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The chilled water dispenser quantity (1) in number is a component of the Victoria Class Submarine (VCS) Improved Galley.

1.1.2 System Overview.

The improved galley chilled water dispenser replaces the current galley juice dispenser (used as water dispenser).

1.1.2.1 The current juice dispenser is used for providing self-serve chilled water.

Figure 1-Current Juice/Water Dispenser

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1.		No Government Documents

2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	Document	Title
1.		No Non-Government Documents

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

3 SYSTEM REQUIREMENTS

3.1 General

3.1.1 Common requirements across all improved galley components (excluding, pots, pans and utensils) are contained in Annex B TSOR Common. Unique requirements to the juice dispenser/water dispenser are contained in this TSOR.

3.1.2 Use

3.1.2.1 The chilled water dispenser must meet the use requirements identified in Annex B TSOR Common Section 3.1.2.

3.2 Required Modes and Sub-modes

3.2.1 The chilled water dispenser is off or on.

3.2.1.1 Off. When the chilled water dispenser is off, self-serve water is available; however, it is at the temperature of the submarine’s domestic fresh water.

3.2.1.2 On. When the chilled water dispenser is on, submarine domestic fresh water is chilled to a temperature that is suitable for drinking.

3.3 Functional Requirements

3.3.1 The chilled water dispenser must include controls and indication, a water chiller, with or without a reservoir, and a chilled water faucet.

3.3.1.1 Controls and Indicator

3.3.1.1.1 The chilled water dispenser must have power on/off switch and a chilled water on indicator.

3.3.1.2 Water Chiller/Reservoir

3.3.1.2.1 The water chiller/reservoir must be plumbed into the submarine’s domestic fresh water supply. The chiller/reservoir may be plumbed into this supply by an appropriate water filter.

3.3.1.2.2 The water chiller may chill water on demand (in which case no WATER reservoir is required), or the water chiller may chill water in the chiller reservoir.

3.3.1.2.3 If a chiller/reservoir is used, the water reservoir automatically re-fills as water is transferred to the user via the water faucet.

3.3.1.3 Faucet

3.3.1.3.1 The chilled water faucet must be of a toggle on/spring back type.

3.3.1.4 The chilled water faucet must be located in a position on the front of the chilled water dispenser such that it can accommodate standard water bottles, up to 1 liter.

3.3.1.5 The chilled water faucet must have a spillage reservoir located below it capable of holding up to 0.5 liters of spilled chilled water.

3.4 External Interfaces

3.4.1 The chilled water dispenser has the following external interfaces: electrical, fresh water and mechanical.

3.4.1.1 Electrical Interface. The chilled water dispenser must interface directly with the submarine's 120 V, 60 Hz electrical system via a cord and a plug.

3.4.1.2 Domestic Fresh Water Interface. The chilled water dispenser must interface with submarine's domestic fresh water system via a fresh water line. A water filter may or may not be included with this line.

3.4.1.3 Mechanical Interfaces. The chilled water dispenser must interface directly in its location via mountings that meet shock and vibration qualification requirements.

3.5 Safety Requirements

3.5.1 Personnel Safety

3.5.1.1 The chilled water dispenser must meet the personnel safety requirements identified in Annex B TSOR Common Section 3.5.1.

3.5.2 Material Safety

3.5.2.1 The chilled water dispenser must meet the material safety requirements identified in Annex B TSOR Common Section 3.5.2.

3.5.3 Electrical Safety

3.5.3.1 The chilled water dispenser must meet the electrical safety requirements identified in Annex B TSOR Common Section 3.5.3.

3.6 Quality Factors

3.6.1 Availability

3.6.1.1 The chilled water dispenser must meet the availability requirements as identified in Annex B TSOR Common Section 3.6.1.

3.6.2 Mean Time Between Failure

3.6.2.1 The chilled water dispenser must meet the mean time between failure requirements as identified in Annex B TSOR Common Section 3.6.2.

3.6.3 Design Life

3.6.3.1 The chilled water dispenser must meet the design life requirements as identified in Annex B TSOR Common Section 3.6.3.

3.7 Design and Construction Constraints

3.7.1 Functional Compatibility

3.7.1.1 The chilled water dispenser must be functionally compatible, as described in Section 3.2 above, with the unit it is replacing

3.7.2 Form Compatibility

3.7.2.1 The chilled water dispenser form (outside dimensions) will depend on where it is being installed.

3.7.2.2 Currently, the juice dispenser that is being used as a chilled water dispenser resides beside the coffee machine., and is approximately 750 millimeters (mm) high, 240 mm wide, and 600 mm deep.

3.7.2.3 In the improved galley design, there is preference (if space, plumbing and power requirements permit) for the chilled water dispenser to be installed in the space that the current milk machine is located (which is being removed and not replaced, and resides just outside the galley). More information for the Milk Dispenser is found in TSOR Appendix 9.

3.7.3 Fit Compatibility

3.7.3.1 The chilled water dispenser must be fit compatible with the unit it is replacing.

3.7.3.1.1 Electrical Fit. The chilled water dispenser's electrical connections must connect directly to the electrical circuits, external to the water dispenser, without modifications to these circuits. The current juice/water dispenser is powered by 120 Volts (V), 1 phase, 60 Hertz (Hz) power.

3.7.3.1.2 Electrical Power Consumption. The chilled water dispenser must not consume more power than the juice dispenser unit it is replacing, which in kilowatts (kW) is 912kWh/yr.

3.7.3.1.3 Mechanical Fit. The chilled water dispenser's mechanical interface with the existing submarine mounting arrangements must connect directly to these mounting arrangements without modifications to the mounting arrangements.

3.7.4 Weight Compatibility

3.7.4.1 The chilled water dispenser must not weigh more than the weight of the unit it is replacing which in kilograms (kg) is 25.696 kilograms (kg).

3.7.5 Modular Design

3.7.5.1 The chilled water dispenser must be of modular design requirements, to the maximum extent possible, as identified in Annex B TSOR Common Section 3.7.5.

3.7.6 Material

3.7.6.1 The chilled water dispenser may be made of approved commercial off the shelf (COTS) material.

3.7.7 Paint

3.7.7.1 If painted, the chilled water dispenser may retain its original COTS paint scheme.

3.8 Environmental Requirements

3.8.1 The chilled water dispenser must meet COTS environmental requirements. The chilled water dispenser must be secured against the shock and vibration requirements identified in Annex B TSOR Common Section 3.7.

3.9 Installation Requirements

3.9.1 The chilled water dispenser must meet the installation requirements identified in Annex B TSOR Common Section 3.9.

3.10 Human Factors

3.10.1 The chilled water dispenser must meet the human factors requirements identified in Annex B TSOR Common Section 3.10.

3.11 Maintenance Requirements

3.11.1 The chilled water dispenser must meet the maintenance requirements as identified in Annex B TSOR Common Section 3.11.

APPENDIX 5

TECHNICAL STATEMENT OF REQUIREMENT

GALLEY IMPROVEMENT – MICROWAVE

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

NOTICE

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The Microwave quantity (1) in number is a component of the Victoria Class Submarine Improved Galley.

1.1.2 System Overview.

1.1.2.1 The improved galley Microwave replaces the current galley Microwave which is different on each platform. The current fitted Microwave is a commercial, off the shelf item purchased by each boat individually.

1.1.2.2 The Microwave is used for re-heating meals for those not able to eat at regular meal times.

1.1.2.3 The Microwave is not used by the cooks during meal preparation time.

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1.		No Government Documents

2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	Document	Title
1.		No Non-Government Documents

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

3 SYSTEM REQUIREMENTS

3.1 General

3.1.1 Common requirements across all improved galley components (excluding, pots, pans and utensils) are contained in Annex B TSOR Common. Unique requirements to the Microwave are contained in this TSOR.

3.1.2 Use

3.1.2.1 The Microwave must meet the use requirements identified in Annex B TSOR Common Section 3.1.2.

3.2 Required Modes and Sub-modes

3.2.1 The Microwave can be off or on.

3.2.1.1 When off, no current flows to the Microwave.

3.2.2 When on, the Microwave functions.

3.3 Functional Requirements

3.3.1.1 The Microwave must include controls and indicators.

3.3.1.2 The Microwave must include easy time settings, selectable power levels and digital display.

3.4 External Interfaces

3.4.1 The Microwave has the following external interfaces: electrical, and mechanical.

3.4.1.1 Electrical Interface. The Microwave must interface directly with the submarine’s 120 V, 60 Hz electrical system via a cord and a plug.

3.4.1.2 Mechanical Interfaces. The Microwave must interface directly with galley shelf and counter space via legs which meet shock qualification requirements.

3.5 Safety Requirements

3.5.1 Personnel Safety

3.5.1.1 The Microwave must meet the personnel safety requirements identified in Annex B TSOR Common Section 3.5.1.

3.5.2 Material Safety

3.5.2.1 The Microwave must meet the material safety requirements identified in Annex B TSOR Common Section 3.5.2.

3.5.3 Electrical Safety

3.5.3.1 The Microwave must meet the electrical safety requirements identified in Annex B TSOR Common Section 3.5.3.

3.6 Quality Factors

3.6.1 Availability

3.6.1.1 The Microwave must meet the availability requirements as identified in Annex B TSOR Common Section 3.6.1.

3.6.2 Mean Time Between Failure

3.6.2.1 The Microwave must meet the mean time between failure requirements as identified in Annex B TSOR Common Section 3.6.2.

3.6.3 Design Life

3.6.3.1 The Microwave must meet the design life requirements as identified in Annex B TSOR Common Section 3.6.3.

3.6.4 Endurance

3.6.4.1 The Microwave must meet, or exceed, the current fitted microwave requirements for endurance.

3.7 Design and Construction Constraints

3.7.1 Functional Compatibility

3.7.1.1 The Microwave must be functionally compatible, as described in Section 3.2 above, with the unit it is replacing.

3.7.2 Form Compatibility

3.7.2.1 The Microwave form (outside dimensions) must at a maximum be equal to the outside dimensions of the unit it is replacing, which including legs, in inches (“) is 12” High x 20” Wide x 14.25” Deep on HMCS WINDSOR.

3.7.2.2 The Microwave sits on a fitted shelf. Each boat has a slightly different dimension of this shelf space.

3.7.2.3 Using measurements from HMCS WINDSOR and HMCS CORNER BROOK, the shelf space for the microwave in inches (“) is 12.5” to 14” in Height, 23” to 26” in Width, and 14” to 14.25” in Depth.

3.7.3 Fit Compatibility

3.7.3.1 The Microwave must be fit compatible with the unit it is replacing.

3.7.3.1.1 Electrical Fit. The Microwave’s electrical connections must connect directly to the electrical circuits, external to the Microwave, without modifications to these circuits. The current Microwave is powered by 115 Volts (V), 1 phase, 60 Hertz (Hz) power.

3.7.3.1.2 Electrical Power Consumption. The Microwave must not consume more power than the unit it is replacing which in kilowatts (kW) is 215kWh/yr.

3.7.3.1.3 Mechanical Fit. The Microwave’s mechanical interface with the existing submarine mounting arrangements must connect directly to these mounting arrangements without modifications to the mounting arrangements.

3.7.4 Weight Compatibility

3.7.4.1 The Microwave must not weigh more than the weight of the unit it is replacing which in kilograms (kg) is 18 kilograms (kg).

3.7.5 Modular Design

3.7.5.1 The Microwave must be of modular design requirements, to the maximum extent possible, as identified in Annex B TSOR Common Section 3.7.5.

3.7.6 Material

3.7.6.1 The Microwave may be made of approved commercial off the shelf (COTS) material.

3.7.7 Paint

3.7.7.1 If painted, the Microwave may retain its original COTS paint scheme.

3.8 Environmental Requirements

3.8.1 The Microwave must meet COTS environmental requirements. The Microwave must be secured against the shock and vibration requirements identified in Annex B TSOR Common Section 3.7.

3.9 Installation Requirements

3.9.1 The Microwave must meet the installation requirements identified in Annex B TSOR Common Section 3.9.

3.10 Human Factors

3.10.1 The Microwave must meet the human factors requirements identified in Annex B TSOR Common Section 3.10.

3.11 Maintenance Requirements

3.11.1 The Microwave must meet the maintenance requirements as identified in Annex B TSOR Common Section 3.11.

APPENDIX 6

TECHNICAL STATEMENT OF REQUIREMENT

GALLEY IMPROVEMENT – STEWARD'S SINK

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

NOTICE

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The Steward’s Sink quantity (1) in number is a component of the Victoria Class Submarine Improved Galley.

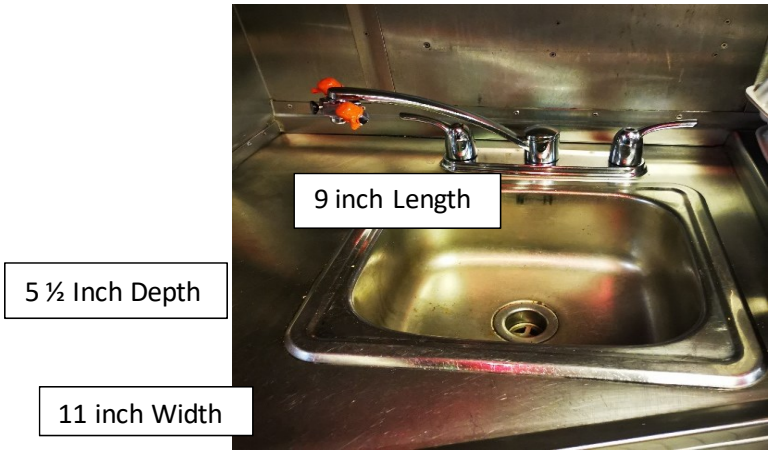
1.1.2 System Overview

1.1.2.1 The purpose of the Steward's Sink is to wash the Tableware from the wardroom. The current fitted Stewards’ Sink is too small to fit a 10” dinner plate.

1.1.2.2 The senior rates mess and junior rates mess have their own sink to wash Tableware.

1.1.2.3 The current plumbing footprint for the Steward’s Sink cannot change, but it may be possible to use the surrounding space more efficiently making room for a slightly larger sink in the same space.

1.1.2.4 The Steward’s Sink on HMCS CORNER BROOK, is shown in Figure 1 below with a photo, and drawing of the dimensions of the space.



STEWARD'S SINK

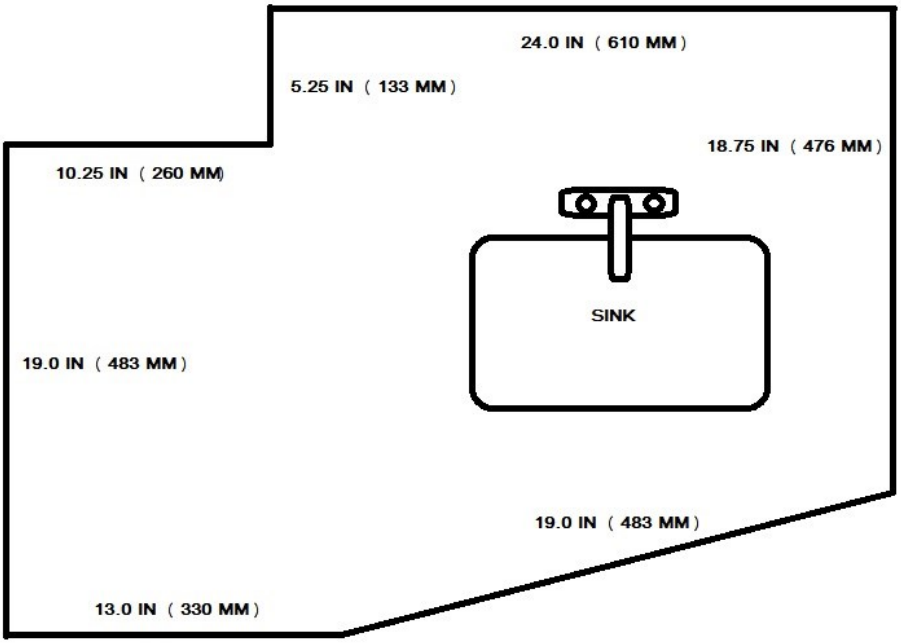


Figure 1 – Steward's Sink

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1.		No Government Documents

2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	Document	Title
1.		No Non-Government Documents

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

3 SYSTEM REQUIREMENTS

3.1 General

3.1.1 Common requirements across all improved galley components (excluding, pots, pans and utensils) are contained in Annex B TSOR Common. Unique requirements to the Steward's Sink are contained in this TSOR.

3.1.2 Use

3.1.2.1 The Steward's Sink must meet the use requirements identified in Annex B TSOR Common Section 3.1.2.

3.2 Functional Requirements

3.2.1.1 The Steward's Sink must be larger than the existing sink, which in inches (“) is 11” Width, 9” Length, and 5.5” Deep.

3.2.1.2 The Steward's Sink must fit into the existing plumbing and current footprint.

3.2.1.3 The existing counter space around the fitted sink, shown below in Figure 2, may allow for a larger or deeper sink fitting into the existing space and current plumbing.

STEWARD'S SINK

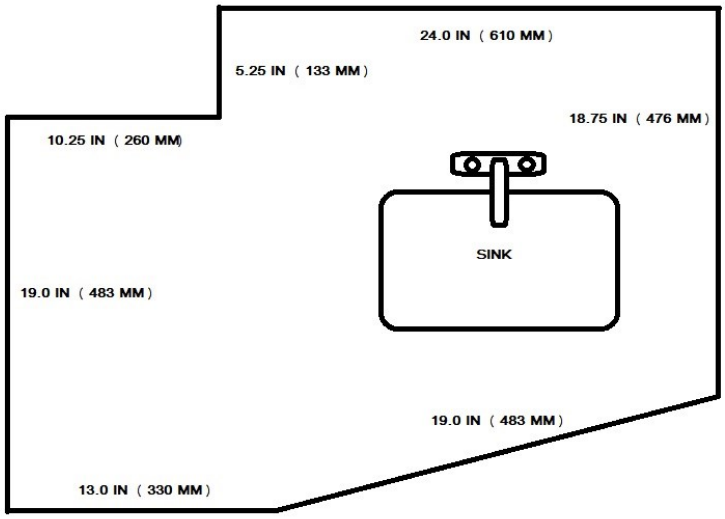


Figure 2 – Dimensions of space surrounding Steward's Sink

3.3 External Interfaces

3.3.1 The Steward's Sink has the following external interfaces: plumbing.

3.3.1.1 Plumbing Interface. The Steward's Sink must interface directly with the existing plumbing, and within the present counter space.

3.4 Safety Requirements

3.4.1 Personnel Safety

3.4.1.1 The Steward's Sink must meet the personnel safety requirements identified in Annex B TSOR Common Section 3.5.1.

3.4.2 Material Safety

3.4.2.1 The Steward's Sink must meet the material safety requirements identified in Annex B TSOR Common Section 3.5.2.

3.4.3 Electrical Safety

3.4.3.1 The Steward's Sink must meet the electrical safety requirements identified in Annex B TSOR Common Section 3.5.3.

3.5 Quality Factors

3.5.1 Availability

3.5.1.1 The Steward's Sink must meet the availability requirements as identified in Annex B TSOR Common Section 3.6.1.

3.5.2 Mean Time Between Failure

3.5.2.1 The Steward's Sink must meet the mean time between failure requirements as identified in Annex B TSOR Common Section 3.6.2.

3.5.3 Design Life

3.5.3.1 The Steward's Sink must meet the design life requirements as identified in Annex B TSOR Common Section 3.6.3.

3.5.4 Endurance

3.5.4.1 The Steward's Sink must meet, or exceed, the current fitted Steward's Sink requirements for endurance.

3.6 Design and Construction Constraints

3.6.1 Functional Compatibility

3.6.1.1 The Steward's Sink must be functionally compatible, as described in Section 3.2 above, with the unit it is replacing.

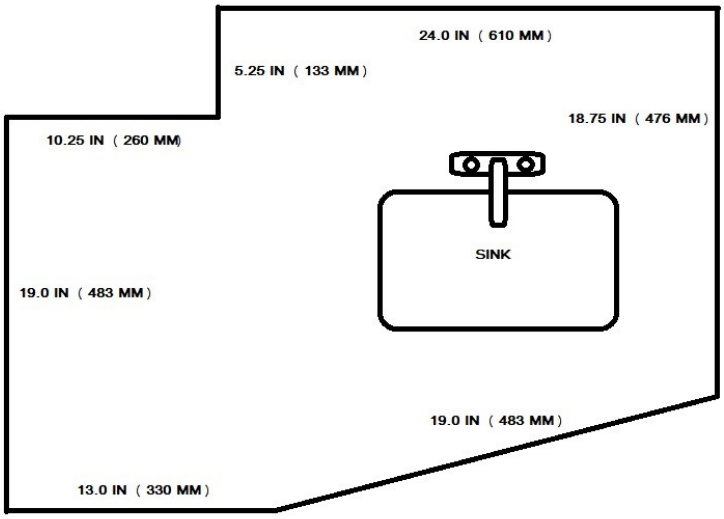
3.6.2 Form Compatibility

3.6.2.1 The Steward's Sink form (outside dimensions) must be larger than the current dimensions of the sink it is replacing which, in inches (") is 11" Width x 9" Length x 5.5" Deep on HMCS CORNER BROOK.

3.6.2.2 The Steward's Sink is fitted in an area that is:

3.6.2.3 Using measurements from HMCS CORNER BROOK, the shelf space for the Steward's Sink in inches (") is:

STEWARD'S SINK



3.6.3 Fit Compatibility

3.6.3.1 The Steward's Sink must be fit compatible with the unit it is replacing.

3.6.3.1.1 Plumbing Fit. The Steward's Sink's plumbing requirements must not differ from those that are existing.

3.6.4 Weight Compatibility

3.6.4.1 The Steward's Sink must not weigh more than the weight of the unit it is replacing which in kilograms (kg) is 4.5 kilograms (kg).

3.6.5 Modular Design

3.6.5.1 The Steward's Sink must be of modular design requirements, to the maximum extent possible, as identified in Annex B TSOR Common Section 3.7.5.

3.6.6 Material

3.6.6.1 The Steward's Sink must be made of stainless steel.

3.6.7 Paint

3.6.7.1 If painted, the Steward's Sink may retain its original COTS paint scheme.

3.7 Environmental Requirements

3.7.1 The Steward's Sink must meet COTS environmental requirements. The Steward's Sink must be secured against the shock and vibration requirements identified in Annex B TSOR Common Section 3.7.

3.8 Installation Requirements

3.8.1 The Steward's Sink must meet the installation requirements identified in Annex B TSOR Common Section 3.9.

3.9 Human Factors

3.9.1 The Steward's Sink must meet the human factors requirements identified in Annex B TSOR Common Section 3.10.

3.10 Maintenance Requirements

3.10.1 The Steward's Sink must meet the maintenance requirements as identified in Annex B TSOR Common Section 3.11.

APPENDIX 7

CURRENT SPECIFICATION

GALLEY IMPROVEMENT – TO BE REMOVED DEEP FAT FRYER

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The deep fat fryer quantity (1) in number is a component of the Victoria Class Submarine (VCS) current galley. It is to be removed without replacement during the improved galley project. On HMCS WINDSOR, it has already been removed and replaced with a custom storage cabinet.

1.1.2 System Overview

The current deep fat fryer, when used, was used to deep fat fry foods. Since deep fat fried foods are no longer considered healthy eating by the Canadian Forces, these fryers are no longer used by the submarine service.

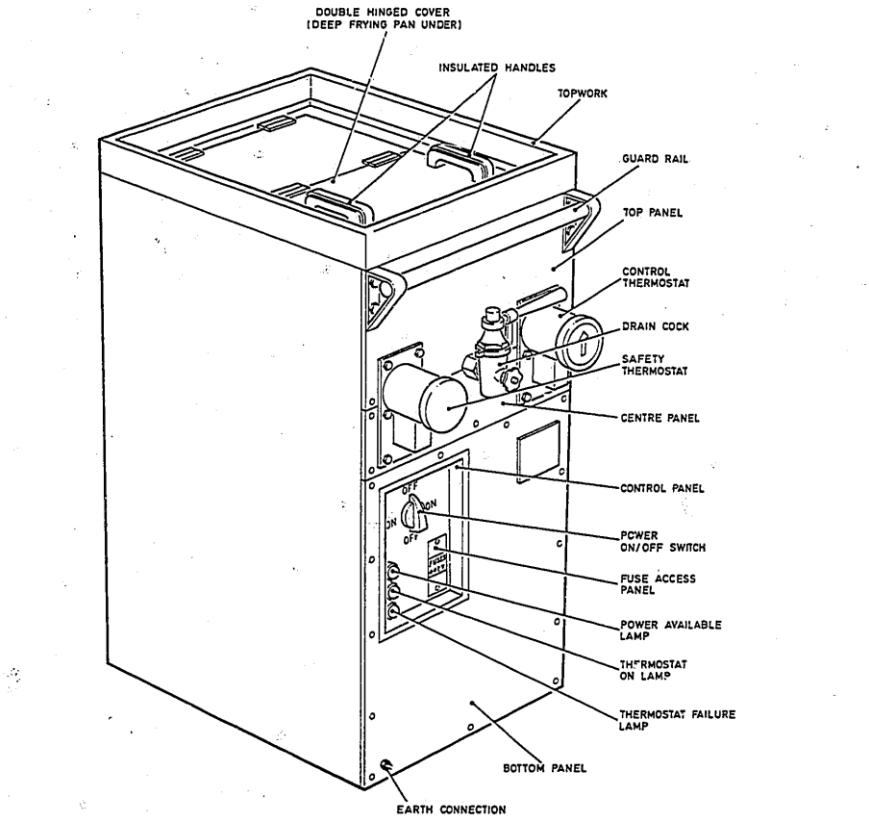

Figure 1-Current Deep Fat Fryer

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
1.	BRF 1966(25)02	Deep Fat Fryer

2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

2.2.2 If any referenced standard has been superseded by a new revision or it has become obsolete and it has been replaced by a new standard or it has not been replaced, then the Contractor must propose the use of the latest revision or replaced standard or an equivalent standard respectively.

Table 2: List of Non-Government Documents

Item	Document	Title
1.		No Non-Government Documents

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

3 CURRENT SPECIFICATIONS

3.1 General

3.1.1 The current deep fat fryers specifications can be found below. The contractor is free to use the power, weight and space freed up by removal of the deep fat fryer as power, weight and space offsets in the improved galley design.

Manufacturer:	Henry Nuttall (Rochdale) Ltd
Type:	305 x 407 Deep Fat Fryer
Heating Elements:	3 in number, 2.5kW, 440V
Electrical:	440V, 3 phase, 60Hz
Weight:	130 kg
Height:	915 mm
Width:	460 mm
Depth:	550 mm

APPENDIX 8

CURRENT SPECIFICATION

GALLEY IMPROVEMENT – TO BE REMOVED COFFEE MACHINE

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

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1 SCOPE

1.1 System Identification

1.1.1 The coffee machine quantity (1) in number is a component of the Victoria Class Submarine (VCS) current galley. It is to be removed from the galley without replacement during the improved galley project. In lieu of a single coffee machine in the improved galley, the messes and mess decks projects will provide coffee machines in these spaces.

1.1.2 System Overview.

The current coffee machine is used to provide on demand coffee and hot water for other beverages.

Figure 1-Current Coffee Machine

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

Item	Document Number	Title
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2.2 Non-Government Documents

2.2.1 Where a section of this SOW references a standard, the whole standard may or may not apply. Where the whole standard does not apply, the tailoring required by the Project Manager (PM) or Technical Authority (TA) will be indicated in the section. The Contractor must specify the extent of his compliance to the referenced standard in his proposal.

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Table 2: List of Non-Government Documents

Item	**Standard**	**Title**
1.		Bunn 23050.6001 Coffee Maker Specification Sheet

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

3 CURRENT SPECIFICATIONS

3.1 General

3.1.1 The current coffee machine's specifications can be found below. The contractor is free to use the power, weight and space freed up by removal of the current coffee machine as power, weight and space offsets in the improved galley design.

Manufacturer:	Bunn
Type:	Single 120V®, plumbed
Product No:	23050.0007
Capacity: cups/hour	Brews 1.9, 3.8 or 5.7 liter batches, 85 236 ml (8 oz)
Electrical:	120 V, 1 phase, 60 Hz, 17.8 Amps, 2100 Watts
Weight:	25.696 kg
Height:	749 mm
Width:	239 mm
Depth:	617 mm

APPENDIX 9

CURRENT SPECIFICATION

GALLEY IMPROVEMENT – TO BE REMOVED MILK DISPENSER

FOR THE

VICTORIA CLASS SUBMARINE MODERNIZATION

CONTRACT NO. W8472-235880

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Table of Contents

1 SCOPE

1.1 System Identification

1.1.1 The milk dispenser quantity (1) in number is a component of the Victoria Class Submarine (VCS) current galley although it is located just outside the galley. It is to be removed from the galley without replacement during the improved galley project. In lieu of a single milk dispenser in the improved galley, the refrigerators in galley and messes will provide cartons of milk for use in these spaces.

1.1.2 System Overview.

The current milk dispenser is used to provide on demand milk.

Figure 1-Current Milk dispenser

2 APPLICABLE DOCUMENTS

2.1 Government Documents

2.1.1 The prescribed versions of the following documents are a part of this specification to the extent specified herein.

Table 1: List of Government Documents

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Table 2: List of Non-Government Documents

Item	Document Number	Title
1.		Silverking Majestic Series Milk Dispensers Models: SKMAJ21, SKMAJ2, SKMAJ3 115V/60Hz Specification Guide

2.3 Order of Precedence

2.3.1 In the event of a conflict between the contents of this document and the applicable portions of the referenced documents the contractor shall inform the Contract Authority (CA) of the differences and request a resolution.

3 CURRENT SPECIFICATIONS

3.1 General

3.1.1 The current milk dispenser's specifications can be found below. The contractor is free to use the power, weight and space freed up by removal of the current milk dispenser as power, weight and space offsets in the improved galley design.

Manufacturer:	MARMON Foodservice Technologies
Type:	Silverking Milk Dispenser
Product No:	SKMAJ1-C3
Capacity:	Single valve 6 gallons
Electrical:	120 V, 1 phase, 60 Hz, 1.5 Amps
Weight:	49.9 kg
Height:	1003.31 mm
Width:	404.65 mm
Depth:	433.41 mm