

ANNEX "A" STATEMENT OF WORK

DY250 SCRUBBER MAINTENANCE AND REPAIR

TABLE OF CONTENTS

1	General (Description of Work).....	
1.1	Statement of Work	
1.2	Project Description.....	
1.3	Project Background.....	
1.4	Codes, Standards and Regulations	
1.5	Documents Required on Site	
1.6	Work Schedule.....	
1.7	Contractor Use of Site.....	
1.8	Coordination of Services.....	
1.9	Equipment.....	
1.10	Site Damage	
1.11	Sanitary Facilities	
1.12	Site Clean-up	
2	Fire Safety Requirements	
2.1	Fire Safety Plan	
2.2	Reporting Fires	
2.3	Fire Protection System.....	
2.4	Blockage of Roads.....	
2.5	Smoking Precautions	
2.6	Rubbish and Waste Materials.....	
2.7	Flammable and Combustible Fluids	
2.8	Hazardous Substances.....	
2.9	Questions or Clarification.....	
3	Environmental Protection	
3.1	Disposal of Wastes	
3.2	Environmental Control	
4	Material and Equipment.....	
4.1	General	
4.2	Manufacture Instructions	
4.3	Delivery and Storage	
5	Description of Services	
5.1	General Outline.....	
5.2	Scheduled Maintenance Program	
5.3	Monthly Inspection	
5.4	Yearly Inspection	

5.5 Description of Maintenance and Repair Work
5.6 Scheduled Inspections.....
5.7 Planned Work – Maintenance and Repairs under Task Authorization.....
5.8 Estimated Hours by Trade for Planned Work.....
5.9 Response Time for Planned Work.....
6 Response Time for Emergency Work.....

Appendix 1 - Monthly Inspection

Appendix 2 - Yearly Inspection All Scrubbers

1. Scope

1.1 Statement of Work (SOW)

1. The SOW describes the contracted services and the deliverables required for the scheduled maintenance, repairs and replacements of parts associated with five Electroplating Scrubbers located at CFB Esquimalt in Dockyard building 250.

1.2 Project Description

1. In general terms only, this work consists of Preventive Maintenance Inspections (PMI) on a monthly and yearly basis.
2. The inspections are to be conducted as detailed in the manufacturers operations and maintenance manuals (O&Ms) and the monthly and annual inspection checklist supplied by DND.
3. Repairs to the scrubbers and their integral systems as a result of defects found during the inspection or planned maintenance will be done under this contract on separate tasks as required.

1.3 Project Background

1. The Electroplating shop is a facility located in Dockyard building 250. There are 5 scrubbers that filter the air before exhausting to the outside atmosphere. Each scrubber is dedicated to an electroplating process.
 - a) Scrubber 1 is a Alkaline Scrubber
 - b) Scrubber 2 is an Acid Scrubber
 - c) Scrubber 3 is a Cyanide Scrubber
 - d) Scrubber 4 is a Hexavalent Chromium Scrubber
 - e) Scrubber 5 is a Pressure Wash Steam Scrubber
2. Monthly inspections are required to confirm each scrubber is operating correctly and to record various pressure and level gages.
3. Each scrubber has internal filters which require maintenance and installation as outlined in the O&Ms. Filter replacement is not part of the monthly or annual inspections and a separate task will be raised when replacement is required.
4. When a scrubber is not working as designed, maintenance and repairs shall be done as well as parts supplied and installed as needed. Maintenance and repairs are not part of the monthly or annual inspections and a separate task will be raised.

1.4 Codes and Standards and Regulations

1. Perform work in accordance with the most recent National Standards Building Code of Canada (NBC), Canadian Electrical Code, Environment Canada Acts and Regulations, and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
2. Meet or exceed requirements of contract documents, specified standards, codes and referenced documents.
3. Meet or exceed all environmental and fire regulation detailed in sections two and three.

1.5 Documents Required on Site

1. Maintain at job site, one copy of each of the following:
 - a) O&M Manuals for each Scrubber
 - b) Monthly and Annual Inspection Checklists
 - c) MSDS information for all products used on site

1.6 Work Schedule

1. Scheduling of inspections, maintenance and any repairs are to be coordinated by the Contractor with the DND Project Authority.
2. Operations may take priority over any scheduled maintenance and repairs. DND will endeavor to provide 5 working days' notice of any necessary schedule changes.
3. Monthly inspections will typically be scheduled during Regular Hours (Monday to Friday, 0730hrs – 1600hrs). Annual inspections will typically be scheduled outside Regular Hours, to accommodate downtime and regular operations.

1.7 Contractor Use of Site

1. Access to and movement around the site is subject to:
 - a) Security regulations established by DND.
 - b) DND Operations
 - c) Traffic regulations established by DND.
 - d) Contractor vehicles being clearly marked.
 - e) Provide a list of all employees and sub-contractors, when requested.
 - f) Do not unreasonably encumber site with materials or equipment.
 - g) Park vehicles where designated by DND Project Authority.

1.8 Coordination of Services

1. The Contractor shall be responsible for the satisfactory completion of the work and shall be responsible for the coordination of the work of all subcontractors.

1.9 Equipment

1. Maintain construction equipment and plant in good operating order.
2. On request, prove to the satisfaction of the DND Project Authority that the equipment is adequate and safe to carry out the work to the quality specified, meeting all work place safety requirements.

1.10 Site Damage

1. The Contractor shall make good any damage to existing structures and facilities at the site, or adjacent sites, resulting from his operation under the contract.

1.11 Sanitary Facilities

1. DND will provide sanitary facilities such as washrooms in DY250 for the contractor's personnel.

1.12 Site Cleanup

1. Prevent accumulation of waste which creates hazardous conditions.
2. Store volatile waste in covered metal containers and remove from premises at end of each working day.
3. Conduct cleaning and disposal operations to comply with local and provincial ordinances, antipollution laws and regulations

END OF SECTION

2. Fire Safety Requirements

2.1 Fire safety Plan

1. Contractors and their personnel shall be familiar with this section and its requirements.

2.2 Reporting Fires

1. Know the location of nearest fire alarm box and telephone, including the emergency phone number.
2. Report immediately all fire incidents to the Fire Department as follows:
 - a. Activate nearest fire alarm box
 - b. Telephone: 98-911 (Emergency, only on Base phones).
 - c. 911 (Emergency, only on non - Base phones).
3. Person activating fire alarm box shall remain at the box if safe to do so, to direct the Fire Department to the fire.
4. When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

2.3 Fire Protection System

1. Fire hydrants, standpipes and hose systems shall not be used for any purpose other than firefighting unless authorized by the base Fire Hall.
2. Any work being done under this contract involving an open flame will require the contractor to obtain a Hot Work permit. This permit shall be issued by the Base Fire Hall, which is located in building NAD141. Phone number 250-363-1911
3. Supply fire extinguishers, as required by the base Fire Hall, necessary to protect the work in progress and the contractor's equipment on site.

2.4 Blockage of Roads

1. Advise Fire Hall of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by Fire Hall, and erecting of barricades.

2.5 Smoking Precautions

1. Observe CFB Esquimalt smoking regulations at all times.

2.6 Rubbish and Waste Materials

1. Rubbish and waste materials are to be kept to a minimum.
2. The burning of rubbish is prohibited
3. Remove all rubbish and waste materials at the end of each work day.
4. Storage of oily waste, rags or materials subject to spontaneous combustion is not permitted. Material and equipment required to perform work in this contract will only be stored in areas approved by the DND Project Authority.

2.7 Flammable and Combustible Fluids

1. The handling, storage and use of flammable and combustible liquids are to be governed by the current National Fire Code of Canada.
2. Flammable and combustible liquids such as gasoline, kerosene and naphtha shall be kept for ready use in quantities not exceeding 45 litres. They shall be stored in approved safety containers bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Transfer of flammable and combustible liquids is prohibited within buildings or on jetties.
3. Transfer of flammable and combustible liquids in the vicinity of open flames or any type of heat-producing devices is prohibited.
4. Flammable liquids having a flash point below 38°C such as naphtha or gasoline shall not be used as solvents or cleaning agents.
5. Flammable and combustible waste liquids will not be stored on DND property after normal working hour or upon completion of work.

2.8 Hazardous Substances

1. Work entailing the use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creates a hazard to life, safety or health, will be in accordance with the current National Fire Code of Canada.
2. When work is carried out in dangerous or hazardous areas involving use of heat, the contractor is to provide fire watchers, equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with the level of protection necessary for Fire Watch is at the discretion of the Fire Hall. Contractors are responsible for providing fire watch service for work on a scale established in conjunction with the Fire Hall.

2.9 Questions or Clarification

1. Direct any questions or clarification requests regarding Fire Safety to the Fire Hall. 250-363-1911.

END OF SECTION

3. Environmental Protection

3.1 Disposal of Wastes

1. All unused wastes are to be disposed of, off of DND property in a manner that meets all Municipal and Provincial regulations.
2. Do not dispose of any waste or volatile materials, into waterways, storm or sanitary sewers.

3.2 Environmental Control

1. Control emissions from equipment in accordance with local authorities' emission requirements.
2. The Contractor must have a "spill kit" on site during the entire time that the work is being carried out.
3. All waste materials as a result of work detailed in this contract shall be cleaned up and removed to an appropriate container at the end of each work day. Do not allow this material to accumulate. The material shall be removed off site and disposed of at an approved site.

END OF SECTION

4. Material and Equipment

4.1 General

1. Use new material and equipment unless otherwise specified.
2. Use OEM materials and equipment for maintenance and repairs approved by the manufacture unless otherwise specified.
3. Estimated Cost of Materials, parts and filters is 70k per year.

4.2 Manufacturer Instructions

1. Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
2. Notify DND Project Authority in writing of any conflict between these specifications and manufacturer's instructions. The DND Project Authority will designate which document is to be followed.

4.3 Delivery and Storage

1. Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact. Provide WHMIS data sheets for all products being used on site if requested. Maintain copies of all sheets at site.
2. Store material and equipment in accordance with supplier's instructions. Immediately remove rejected material and equipment from site.

END OF SECTION

5. Description of Services

5.1 General Outline

- 1 Services, maintenance, repair and replacement of scrubber parts will be done under a scheduled maintenance program and a planned repair program. See appendices for further details about the scheduled maintenance program.

5.2 Scheduled Maintenance Program

1. Each scrubber requires a monthly inspection as well as a yearly inspection.
2. Monthly inspections and yearly inspections are to be schedule in advance and coordinated through the DND Project Authority who will confirm with the facility Supervisor.
3. A minimum of 5 working days will be required to schedule the monthly inspections.
4. A minimum of 30 calendar days are required to schedule the yearly inspections.

5.3 Monthly Inspection

1. Monthly inspection checklist provided by DND to include but not limited to the following:
 - a. Inspection of the scrubber's external surfaces for any fractures or deformation.
 - b. Inspection of all external components for fracture or deformation
 - c. Inspection of all ductwork between the tank and the scrubber for any leaks or breaks
 - d. Record photohelic gauge for the purpose of filtering media condition.
 - e. Record conductivity gauge
 - f. Record liquid flow rate
 - g. Record the water pressure gauge sensor
 - h. Record the pH sensor value
 - i. If required run the purge line for approximately 20 minutes as per O&M
 - j. Record any active alarms lights and what they are for.
2. Monthly inspection checklists are to be completed by the Contractor and submitted electronically to the DND Project Authority within 5 working days of the inspection. Minor issues or recommended maintenance should be reported on the monthly inspection checklists.
3. Any defects, failure, or operational issues that are observed during the monthly inspection that could cause an environmental or any health and safety issues are to be reported immediately to the DND Project Authority and the Shop 125 Supervisor. Names and contacts numbers to be supplied by DND.
4. Monthly checklists are to be electronically filled out and submitted by email or neatly hand written and legible, scanned and sent to the DND Project Authority.

5.4 Yearly Inspection

1. Yearly inspection checklist provided by DND to include but not limited to the following:
 - a. Inspection of the scrubber's internal and external surfaces and components for any fractures or deformation
 - b. Inspection of all ductwork between the tank and the scrubber for any leaks or breaks
 - c. Record liquid flow rate, pressure gauge reading, pH sensor value, photohelic and conductivity gauges as per monthly inspection checklist
 - d. Record any active alarms lights and what they are for.

- e. Schedule shut down through the DND Project Authority and have the electrical locked out for the scrubber being worked on.
 - f. Open access hatches and windows and remove all filters. Give filters to Fleet Maintenance Facility staff for cleaning.
 - g. Remove all sludge and waste materials and dispose of off of DND property
 - h. Pressure wash and clean interior of unit and clean spray nozzles as required and detailed in O&M's.
 - i. Replace the filters and re-assemble unit. Turn the power back on and start up the scrubber to confirm unit is completely operational.
 - j. Confirm the unit is not leaking and that flow rates and pressures are within normal operating limits.
2. Yearly inspection checklists are to be completed by the Contractor and submitted electronically to the DND Project Authority within 5 working days of the inspection. Minor issues or recommended maintenance found during the yearly inspection is to be reported on the yearly inspection checklists.
 3. Any defects, failure, or operational issues that are observed during the yearly inspection that could cause an environmental or health and safety issues are to be report immediately to the DND Project Authority and the Shop 125 Supervisor. Names and contacts numbers to be supplied by DND.
 4. Yearly checklists are to be electronically filled out and submitted by email or neatly hand written and legible, scanned and sent to the DND Project Authority.

5.5 Description of Maintenance and Repair Work

1. **Qualified HAZMAT Technician** will be required to handle hazardous materials and wear appropriate personal protective equipment including self-contained breathing apparatus. Conduct confined space entry as per WCB requirements. Transport and dispose of HAZMAT materials. HAZMAT Technician shall have the qualifications , experience and training required to complete work as detailed in Annex A, conforming to regulations and codes.
2. **Electrician** currently certified in British Columbia will be required to lockout panels to isolate the scrubbers. Work on various electrical motors, pumps and sensors. Have a good knowledge of Programmable Logic Controls and low voltage systems.
3. **Plumber** currently certified in British Columbia will be required to work with various ABS and PVC and copper piping. Remove and replace valves and pressure gauges seals and flanges.
4. **Laborer** will be required to erect scaffolding and other tasks on site in support of the technicians.

5.6 Scheduled Inspections

1. Scheduled monthly and annual inspections on each scrubber will be a firm price.
2. All scheduled inspections will be under a single task having a purchase order number provided by DND Project Authority.
3. Minor repairs up to a value of \$500.00 can be conducted on each of the scrubbers during the monthly inspections. This additional work must be approved by the DND Project Authority prior to being initiated, (by phone or email). Billing for this additional work will be on the same purchase order number as 5.6.2 above but must be a separate line to include:

- a. Description of the additional work
- b. Material costs
- c. Labour costs

5.7 Planned Work – Maintenance and Repairs under Task Authorization

- 1. Planned work will consist of maintenance, repairs or replacement of scrubbers' parts or associate systems.
- 2. This work will normally be generated as a result of monthly inspections, by facility operators or when DND is life cycling components.
- 3. All planned work will have a new purchase order number generated by DND Project Authority.
- 4. All planned work will require an estimated cost and level of effort from the contractor.
- 5. All Planned work will require DND funding approvals before the work can start.
- 6. Approximately 30 Tasks initiating planned work per year.

5.8 Estimated Hours by Trade for Planned Work

- 1. HAZMAT Tech 200 hrs/year
- 2. Electrician 150 hrs/year
- 3. Plumber 350 hrs/year
- 4. Labourer 200 hrs/year

(Above estimated hours do not include scheduled inspections)

5.9 Response Time for Planned Work

- 1. 24hrs to Contact the DND Project Authority by phone or in person after task is received.
- 2. 72hrs for the Contractor to be on site after task is received.
- 3. 5 days to provide a task form with estimated labour and material after task is received.

(All times above excludes Weekends)

6. Response Time for Emergency Work

Emergency work is defined as a major breach in a scrubber which could cause serious health and safety issues and or further damage to the facility. The contractor must have and maintain a 24 hour, 7 days a week phone service though out the duration of this contract.

- 1. 1hr to Contact the DND Project Authority by phone or in person after task is received.
- 2. 3hrs for the Contractor to be on site after task is received.

END OF SECTION

Appendix 1 - Monthly Inspection

Appendix 2 - Yearly Inspection All Scrubbers

Appendix 1 Monthly Inspection Checklist (typical)

SCRUBBER # 1&2 MONTHLY		INSPECTION CHECKLIST	
	Description of work or inspection	Observation or Action Taken	Tech Initial
1	Inspection of the scrubber's external surfaces for any fractures or deformation		
2	Inspection of all external components for fracture or deformation		
3	Inspection of all ductwork in the scrubber room for any leaks or breaks		
4	Inspection of the filtering media for any blockage or build-up		
5	Record liquid flow rate (Normal flow should be around 130 gpm or 492L/min)		
6	Record the water pressure gauge sensor. (Between 30-35 psi or 207-241 kpa)		
7	Record the pH Sensor value (should be close to 7)		
8	Run the purge line for approx 20 minutes as per O&M		
9	Are there any alarms lights active? If there is what are they?		
10	Remarks		
If any defects are identified, RP Ops and Shop 125 Supervisor must be informed.			
Month	Date	Year	Inspector Name
			Inspector Signature

Appendix 1 Monthly Inspection Checklist (typical)

SCRUBBER # 3 MONTHLY INSPECTION CHECKLIST			
	Description of work or inspection	Observation or Action Taken	Tech Initial
1	Inspection of the scrubber's external surfaces for any fractures or deformation		
2	Inspection of all external components for fracture or deformation		
3	Inspection of all ductwork in the scrubber room for any leaks or breaks		
4	Inspection of the filtering media for any blockage or build-up		
5	Record liquid flow rate (Normal flow should be around 80 gpm or 303 L/min)		
6	Record the water pressure gauge sensor. (Between 30-35 psi or 207-241 kpa)		
7	Record the pH Sensor value (should be close to 13)		
8	Run the purge line for approx 20 minutes as per O&M		
9	Are there any alarms lights active? If there is what are they?		
10	Remarks		
If any defects are identified, RP Ops and Shop 125 Supervisor must be informed.			
Month Date Year		Inspector Name	Inspector Signature

Appendix 1 Monthly Inspection Checklist (typical)

SCRUBBER # 4 MONTHLY INSPECTION CHECKLIST			
	Description of work or inspection	Observation or Action Taken	Tech Initial
1	Inspection of the scrubber's external surfaces for any fractures or deformation		
2	Inspection of all external components for fracture or deformation		
3	Inspection of all ductwork in the scrubber room for any leaks or breaks		
4	Inspection of the filtering media for any blockage or build-up		
5	Record liquid flow rate (Normal flow should be around 81 gpm or 307 L/min)		
6	Record the water pressure gauge sensor. (Between 30-35 psi or 207-241 kpa)		
7	Record the pH Sensor value (should be close to 7)		
8	Run the purge line for approx 20 minutes as per O&M		
9	Are there any alarms lights active? If there is what are they?		
10	Remarks		
If any defects are identified, RP Ops and Shop 125 Supervisor must be informed.			
Month	Date	Year	Inspector Name
			Inspector Signature

Appendix 1 Monthly Inspection Checklist (typical)

SCRUBBER # 5 MONTHLY INSPECTION CHECKLIST			
	Description of work or inspection	Observation or Action Taken	Tech Initial
1	Inspection of the scrubber's external surfaces for any fractures or deformation		
2	Inspection of all external components for fracture or deformation		
3	Inspection of all ductwork in the scrubber room for any leaks or breaks		
4	Inspection of the filtering media for any blockage or build-up		
5	Record liquid flow rate (Normal flow should be between 50-70 gpm or 109-265 L/min)		
6	Record the water pressure gauge sensor. (Between 20-22 psi or 138-152 kpa)		
7	Record the pH Sensor value (should be close to 7)		
8	Run the purge line for approx 20 minutes as per O&M		
9	Are there any alarms lights active? If there is what are they?		
10	Remarks		
If any defects are identified, RP Ops and Shop 125 Supervisor must be informed.			
Month Date Year		Inspector Name	Inspector Signature

Appendix 2 Yearly Inspection Checklist

SCRUBBER # ____ YEARLY INSPECTION CHECKLIST			
	Description of work or inspection	Observation or Action Taken	Tech Initial
1	Inspection of the scrubber's internal and external surfaces for any fractures or deformation		
2	Inspection of all ductwork for any leaks or breaks		
3	Record liquid flow rate, Pressure gauge, photohelic gauge, conductivity gauge, and pH sensor value as per monthly inspection checklist		
4	Are there any alarms lights active? If there is what are they?		
5	Schedule shut down through the Project Authority and have the electrical locked out for the scrubber being worked on.		
6	Open access hatches and windows and remove all filters. Give filters to Fleet Maintenance Facility staff for cleaning		
7	Remove all sludge and waste materials and dispose of off of DND property		
8	Pressure wash and clean interior of unit and clean spray nozzles as required and detailed in O&M's.		
9	Replace the filters and re-assemble unit. Turn the power back on and start up the scrubber to confirm unit is completely operational		
10	Confirm the unit is not leaking and that flow rates and pressures are within normal operating limits.		
If any defects are identified, RP Ops and Shop 125 Supervisor must be informed.			
Month Date Year		Inspector Name	Inspector Signature