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DEFENCE CONSTRUCTION CANADA FOR DEPARTMENT OF NATIONAL DEFENCE

Nanisivik Naval Facility (NNF)

Emergency and Spill Response Plan Template

307071-00833-91-PM-REP-0002

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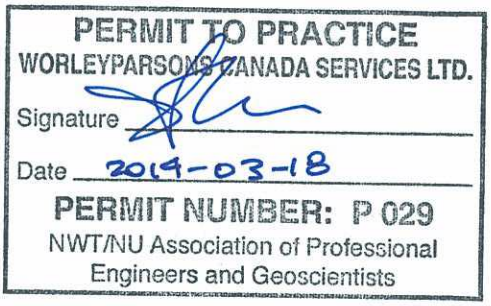

PROJECT 307071-00833 - NANISIVIK NAVAL FACILITY (NNF)

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1. INTRODUCTION

1.1 Objective of the Manual

The objective of this manual is to detail procedures to be followed as preventive measures and in the event of an emergency, such as a fire, power failure, damage to buildings, vehicle and/or heavy equipment accidents, and extreme weather conditions for the Nanisivik Naval Facility (NNF). The manual also details measures to be taken in the event of a fuel spill during fuel transfer, either on land or at sea.

The plan is to be implemented by the Facilities Operator of the NNF.

This manual is a live document which should be revisited and updated periodically as determined by the Facilities Operator (it is recommended this manual be updated annually between the operating and non-operating seasons). Any changes to the manual are to be reviewed with all site personnel and stakeholders ahead of seasonal start-up.

Proper management of this facility through the implementation of this manual is an essential part of safeguarding the environment from leaks or spills of fuel.

1.1.1 Appendices Summary

- Appendix 1 defines the project Work Breakdown Structure (WBS). The major sections of this manual have been grouped according to system and sub-system as defined in the project WBS.
- Appendix 2 contains a list of Project Acronyms and Abbreviations.
- Appendix 3 contains Oil Transfer Guidelines and Standards to be followed when transferring fuel at the NNF. It is the responsibility of the Construction General Contractor and the Facilities Operator to ensure the latest revision of these and all other applicable fuel transfer standards are being followed.
- Appendix 4 contains all applicable Material Safety Data Sheets (MSDS) for safe handling and storage of products at the NNF.
- Appendix 5 includes a Spill Reporting Matrix which defines along one axis all products being stored at the NNF, along the other axis all agencies and associated personnel who must be contacted in the event of a spill.
- Appendix 6 details the process and reference information for quick induction of Emergency Response Personnel at the NNF in the event of an emergency. The intent is to quickly orient them with the facility and its hazards prior to them entering the site.
- Appendix 7 includes an Emergency Facilities Checklist. The checklist can be used for periodic maintenance of emergency equipment, to ensure it is valid and does not require maintenance or replacement.

- Appendix 8 is a quick reference of Observation of Vital Signs. In the event of a medical emergency and in the absence of trained medical personnel, this appendix details medical emergency procedures to secure the victim in preparation for medical evacuation.
- Appendix 9 includes a Bomb Threat Checklist. In the event of a bomb threat, the checklist highlights the procedure to be followed.
- Appendix 10 includes a Medical Information Form template. In the event of a medical emergency, this form can be used to gather vital information on the victim to ensure emergency responders are informed of their status and medical history.
- Appendix 11 includes an Incident Report Form to be developed by the Construction General Contractor to document any emergency or spill event. The form may contain fields such as incident description (including date and time), systems / personnel impacted, root cause analysis, sequence of events, immediate actions, photographs / sketches, witness statements, external notifications.
- Appendix 12 includes a Wildlife Log documenting wildlife encounters at the NNF. The intent is to document species being encountered and track patterns to improve training and awareness for the continued safety of all personnel at the NNF.

1.2 Manual Review and Update Instructions

This document is a template indicating the structure and proposed content of the Emergency and Spill Response Plan Manual for the Nanisivik Naval Facility (NNF).This template is to be completed by the Construction General Contractor with the assistance of a specialist in and emergency and spill response to identify the specific emergency and spill response requirements for the general site components of the NNF.

The Construction General Contractor shall finalize the manuals and/or plans, after construction substantial completion, by updating them to include all final equipment, buildings, infrastructure, and processes. This manual is to be completed and submitted in accordance with the instructions provided in the project construction specifications (Specification No. 01 33 00) by the Construction General Contractor.

1.3 Description of the Site

The purpose of the NNF is to support the Government of Canada's goal of enhancing naval presence in Canadian waters and in particular, the presence of the Canadian military in the Canadian Arctic region. The main objective of the NNF is to provide the basic functional requirements for an Arctic Offshore Patrol Ship (AOPS) berthing and fuelling facility. The NNF is to include a Naval Distillate (ND) bulk fuel storage system for one-year supply, and a functioning berth infrastructure. Other site amenities include fuel transfer pipelines between the wharf and fuel tank farm and associated pumps, a power generation and distribution systems, a storage building, a wharf operator's shelter, the DND Site Office, access roads, lighting, a helicopter landing pad, fencing, and secondary containment for the diesel and ND tanks.

The operating window of the NNF is expected to be between mid-June to mid-October, though periodic visits outside of this window may occur for maintenance or security purposes.

1.4 Scope Outline

This document has been prepared to provide personnel with strategies and information required when contending with emergency situations.

This Emergency and Spill Response Plan provides:

- Ready reference for cleanup of all spills;
- Easy-to-follow procedures for possible emergency situations;
- Ready reference of all relevant emergency contacts; and
- Ready reference of emergency facilities available.

As there is a real possibility of emergencies and spills at the NNF, it is imperative that all personnel understand basic emergency and spill control procedures and that all personnel understand their responsibilities in implementing these procedures. Proper training is required for all personnel at site specifically addressing spills and emergency situations. For further details, refer to the Training Manual Template (Document No. 307071-00833-91-PM-REP-0008).

The manual is to be regularly revised and updated and any amendments are to be made to all registered copies of the manual and recorded.

The emergency procedures in this manual are structured to meet requirements of the Nunavut Impact Review Board and general requirements of the Canada Occupational Safety and Health Regulations 2012.

2. TROUBLESHOOTING

This section includes quick reference information for common issues associated with spills and emergency response at the NNF. It is to be developed by the Construction General Contractor and maintained / updated by the Facilities Operator.

3. SPILLS

Spill response procedures will be provided in this section and will be specific to the material / product spill, the spill location and the receiving environment. Material Safety Data Sheet (MSDS) references are to be used when responding to any chemical spills. All commonly stored chemical, fuel and fluid MSDSs are to be collected and included in Appendix 4.

3.1 Health, Safety, and Environment

This section will describe general health and safety procedures to be followed in the event of spills or emergency events, including mandatory personal protective equipment.

The plan shall include, but not be limited to, the requirement for emergency rations to be kept on-site in case of inclement weather events and the requirement to ensure all site personnel receive training to deal with emergency situations.

A project-specific Health, Safety, and Environment (HSE) Plan is to be developed by the Construction General Contractor for use by the Facilities Operator, knowing that some federal and local HSE guidelines overlap. This document will be executed and maintained by the Facilities Operator.

3.2 Spill Prevention and Preparedness

Include a description of all spill response equipment to be kept on-site, their locations, and records of ongoing inventories as well as measures to be taken to prevent spills with consideration to the following locations and the sections herein:

- Hose and/or flanges located over the water from the wharf deck to the ship;
- Wharf manifold;
- Hose flanges on land;
- Pipe flange locations;
- Pumps;
- Bleed valves;
- Naval distillate tank flanges;
- Diesel tank flanges;
- Vehicle fuelling; and
- Aviation fuelling.

3.3 General Spill Response, Reporting, and Clean-up

Procedures for all spill responses will be provided in this section, including special considerations needed to address various spill locations and potential receiving environments. A spill reporting matrix will also be required that lists the regulatory reporting triggers specific to spill volume and type of material / product spilt. This matrix is to be kept in Appendix 5.

As described in the Operations Manual (Document No. 307071-00833-91-PM-REP-0005), it is the responsibility of the Facilities Operator to check any proposed storage of chemicals or activities within the buildings against the National Fire Code and National Building Code.

Spills as described below will have specific clean-up, handling and disposal requirements depending on what was spilled. As such, the sections below are to include procedures for all types of chemicals / fluids proposed to be stored at the NNF.

3.4 Marine Facilities

Provide spill response plans for the marine facilities with consideration to the following:

- Spill / leak events on or off the wharf.

3.5 Bulk Liquids Facilities

Provide spill response plans with consideration to the items outlined in the following sections for each area of the bulk liquids facilities.

3.5.1 Naval Distillate System

- Spill / leak of naval distillate within bermed area.
- Spill / leak of naval distillate outside bermed area.
- Spill / leak of naval distillate at flexible hose connections from the manifold to the ship (up to 1 m^3 of volume), reference Appendix 3 for oil transfer operations.
- Spill / leak of naval distillate into or near to the sea.

3.5.2 Diesel System

- Spill / leak of diesel inside secondary containment barriers.
- Spill / leak of diesel outside secondary containment barriers.
- Spill / leak of diesel at flexible hose connections from the manifold to the ship (up to 1 m^3 of volume), reference Appendix 3 for oil transfer operations.
- Spill / leak of diesel into the sea.

3.5.3 Mobile Equipment Fuelling

- Spill / leak of diesel within bermed area.
- Spill / leak of diesel at flexible hose connections from the equipment to the pump.
- Spill / leak of diesel from equipment outside of bermed area.

3.5.4 Aviation Fuel (Drums)

- Spill / leak of aviation fuel within bermed area.
- Spill / leak of aviation fuel outside bermed area.
- Spill / leak of aviation fuel into the sea.

3.5.5 Miscellaneous Petroleum, Oil, and Lubricants (POL) Products

- Spill / leak of POL products within bermed area.
- Spill / leak of POL products outside bermed area.
- Spill / leak of POL products into the sea.

3.5.6 Oily Waste Water (OWW) (Drums) System

- Spill / leak of OWW within bermed area.
- Spill / leak of OWW outside bermed area.
- Spill / leak of OWW into the sea.

3.5.7 E-House

- Spill / leak within boundaries of the E-house.

3.6 Buildings

Provide spill response plans with consideration to the items outlined in the following sections for each building area.

3.6.1 General Use Storage Building

- Spill / leak within boundaries of the general use storage building.

3.6.2 Wharf Operator's Shelter (WOS)

- Spill / leak within boundaries of the WOS.

3.6.3 DND Site Office

- Spill / leak within boundaries of the DND Site Office.

3.7 Site Utilities

Provide spill response plans with consideration to the items outlined in the following sections for each area of the site utilities.

3.7.1 Power Generation and Distribution

- Spill / leak within boundaries of a generator module.

3.8 Site Infrastructure

Provide spill response plans with consideration to the items outlined in the following sections for each site infrastructure area.

3.8.1 General

- Spill / leak within boundaries of the bermed and lined storage area.
- Spill / leak in the general area of the NNF (outside the boundaries - all areas not captured elsewhere) - this includes drainage, culverts, beach landing area, roads, existing concrete slab, etc.
- Spill / leak outside the boundaries of the NNF (i.e., along road to Arctic Bay or in Arctic Bay).

3.8.2 Freight, Marshalling, and Laydown Area

- Spill / leak within boundaries of the freight, marshalling and laydown area.

3.8.3 Helicopter Landing

- Spill / leak at the helicopter landing area.

4. ROLES AND RESPONSIBILITIES

This section describes the roles and responsibilities of the Emergency Response Team and on-site medical personnel (if required), and the emergency response coordinator. Refer to the Operations Manual (Document No. 307071-00833-91-PM-REP-0005) for a list of roles and responsibilities.

4.1 Emergency Response Team and On-site Medical Personnel

This section will explain in detail the prime responsibilities and key tasks of key personnel in case of emergency as well as on-site medical personnel requirements during operations. It is the responsibility of the Construction General Contractor to establish whether dedicated on-site medical personnel are required or whether the Operations Team can be trained to handle medical emergencies until help arrives. A list of emergency response equipment that is to be maintained in good working order will also be provided.

4.2 Emergency Prevention and Response

The key tasks for emergency prevention and in the case of an emergency response are to be listed in this section, focusing on preventive measures, preparation, initial emergency response, and post-response responsibilities.

5. PLANNING AND TRAINING REQUIREMENTS

For training requirements for emergency response, preventive training, and spill response, refer to the Training Manual (Document No. 307071-00833-91-PM-REP-0008).

6. INCIDENT NOTIFICATION AND INVESTIGATION

This section will list all regulatory authorities and internal personnel that will be notified of any incidents or accidents that occur, along with the person responsible for and the maximum time limit for such reporting. A time limit will also be provided for the commencement of an investigation after an emergency response.

7. MEDICAL EMERGENCIES

Information on how to respond to medical emergencies will be provided in this section, including contact numbers for external medical support.

8. COMMUNICATION

The process for notification of personnel, authorities, DND, the contract management authority, and emergency services will be detailed in this section. Available communication equipment will also be listed (i.e., satellite phones).

9. EMERGENCY RESPONSE FLOW

Flowcharts depicting the basic sequence of response events and responsibilities for all emergencies are to be provided in this section. It is recommended that dedicated flowcharts be developed for each type of emergency event; however, where appropriate, flowcharts should be grouped / consolidated.

10. EMERGENCY SITUATIONS

This section will list the appropriate prevention and response actions to be taken in specific emergency situations. This section will include but not be limited to the following emergency situations.

10.1 Wildlife Encounters

Provide the prevention and response actions to be taken for wildlife encounters. This section should also include wildlife log requirements and training.

Provide a list of potential wildlife that could be encountered, which species and when they are most present.

10.2 Fuelling Spill / Incident

Provide the prevention and response actions to be taken for a fuelling spill or incident at the wharf (manifold to ship), reference Appendix 3 for oil transfer information.

10.3 Iceberg and Pack Ice Collision with Wharf

Provide the prevention and response actions to be taken for iceberg and pack ice collisions with the wharf.

10.4 Vessel Collision with Wharf

Provide the prevention and response actions to be taken for vessel collision with the wharf.

10.5 Iceberg and Pack Ice Collision with Berthed Vessel

Provide the prevention and response actions to be taken for iceberg and pack ice collisions with a vessel at the berth.

10.6 Iceberg Collision with Bulk Liquids Infrastructure (i.e., pipeline, manifold)

Provide the prevention and response actions to be taken for iceberg collisions with infrastructure.

10.7 Iceberg and Pack Ice Collision during Marine Work (i.e., during anode replacement)

Provide the prevention and response actions to be taken for iceberg and pack ice collisions with infrastructure and personnel during marine works both on the wharf and in the water.

10.8 Underwater Work Emergencies

Provide the prevention and response actions to be taken for any emergencies arising during underwater marine work.

10.9 Vessel / Dock Worker in Water

Provide the prevention and response actions to be taken for rescuing someone in the water.

10.10 Vessel / Dock Worker Fall to Ice / Crevice

Provide the prevention and response actions to be taken for falls on or around the dock.

10.11 Dry Cargo Falling into Water

Provide the prevention and response actions to be taken for retrieval and clean-up of cargo having fallen into water.

10.12 Dry Cargo Falling onto Dock

Provide the prevention and response actions to be taken for cargo that has toppled or fallen onto the dock.

10.13 Mobile Equipment in Water

Provide the prevention and response actions to be taken for retrieval and clean-up mobile equipment having fallen into water.

10.14 Marine Intervention Boat Sinking

Provide the communication lines and support to be maintained for a vessel incident / sinking.

10.15 Shoreline Failure

Provide the prevention and response actions to be taken for shoreline failures.

10.16 Motor Vehicle Accident

Provide the prevention and response actions to be taken for motor vehicle accidents with consideration to the following items:

- Contact with pipeline;
- Contact with building;
- Contact with berm;
- Vehicle driven off the wharf; and
- Vehicle accident off-site (travel to / from site) along road to Arctic Bay.

10.17 Power Failure

Provide the prevention and response actions to be taken for power failures with consideration to the following:

- Failure of primary and back-up generators; and
- Use of DND Site Office generators as back-up in emergency situations.

10.18 Communications Failure

Provide the prevention and response actions to be taken for communications failure with consideration to the following:

- Satellite phone malfunction / failure; and
- Communication breakdown between berthed / arriving vessel and the NNF.

10.19 Fire

Provide the prevention and response actions to be taken in the event of a fire with consideration to the following:

- Tank Farm fire;
- E-house fire;
- General use storage building fire;
- DND Site Office fire including fire in utility unit;
- Generator module fire;
- General area fire; and

- WOS fire.

10.20 Vandalism

Provide the prevention and response actions to be taken in the event of vandalism with consideration to the following:

- Theft;
- Shots fired at NNF infrastructure;
- Damage to bulk liquid facilities causing spill(s) during operating period; and
- Damage to bulk liquid facilities causing spill(s) during non-operating period.

10.21 Extreme Weather

Provide the prevention and response actions to be taken in the event of extreme weather conditions with consideration to the following:

- Storms (including Arctic wind storms, blizzards, etc.);
- Tsunami; and
- Flooding, erosion, loss of containment berm, and loss of road.

10.22 Berthing Accidents

Provide the prevention and response actions to be taken for berthing accidents.

- Vessel collisions;
- Vessel sinking; and
- Dredging considerations or requirements.

10.23 Helicopter Accidents

Provide the prevention and response actions to be taken for helicopter accidents.

10.24 Overdue Transport Vehicle or Vessel

Provide the prevention and response actions to be taken in the event of overdue transport vehicles / vessels with consideration to the following:

- Personnel awaiting the overdue transport at site.

10.25 Bomb Threat, Attacks, Force Protection

Provide the prevention and response actions to be taken in the event of a bomb threat, attack or force protection issue.

10.26 Missing Person

Provide the prevention and response actions to be taken in the event of a missing person.

10.27 Civil Disorder and Illegal Occupancy

Provide the prevention and response actions to be taken in the event of civil disorder and/or illegal occupancy of facility infrastructure.

10.28 Earthquake

Provide the response actions to be taken in the event of an earthquake with consideration to the following:

- Post-earthquake inspection of NNF infrastructure.

11. MEDICAL EVACUATION

Consideration must be given in this section regarding the inability to perform a medical evacuation due to inclement weather.

The NNF Construction General Contractor and the Facilities Operator are **not** to rely on medical personnel from the local communities.

11.1 Helicopter Evacuation from NNF

Provide helicopter evacuation procedures.

11.2 Aircraft Evacuation from Arctic Bay

Provide aircraft evacuation procedures from the Arctic Bay airport.

12. TERMINATION, DEBRIEFING, AND TRAINING

This section will provide a procedure to be followed upon the completion of an emergency response and will include minimum requirements for personnel debriefing, documentation and follow-up training.

Appendix 1 Work Breakdown Structure

00833 Nanisivik Naval Facility Phase 3B - Work Breakdown Structure

System	Sub-System	Critical / Minimum Scope
10 - MARINE FACILITIES		
	11 - GENERAL	
	12 - WHARF	Existing wharf. Upgrades or additions include: Removable foam- filled fenders, bollards, ladders, bull rails, spill boom, safety equipment, and otheramenities as per applicable codes and DND standards. Cell #2 and #3 are to have new concrete decks. Cell #1 concrete deck NOT replaced. Existing bollards will be refurbished (painted). Steel plating (banding) included. Safety equipment, unloading and fuelling hose(s), and shipping container for boom and boom reel storage included. Appendages removed and holes repairs.
	13 - SHORE PROTECTION	Minor repairs to the shoreline at two locations. Removal of existing concrete installed beside Cell 1 and Cell 2.
	15 - WHARF THERMOSYPHON SYSTEM	None.
	16 - WHARF CORROSION PROTECTION SYSTEM	Passive / sacrificial anode cathodic protection system.
	17 - GEOTECHNICAL & GEOTHERMAL INVESTIGATION	Wharf settlement monitoring program taken out of scope. Installation of thermistors, inclinometers, and boreholes included.
20 - BULK LIQUIDS FACILITIES		
	21 - GENERAL	Wharf manifold for Naval Distillate (ND) and Diesel. Removable drip pans included under manifold, connection points and during refueling to protect against spills. Wharf manifold to facilitate connections options of 150mm or 100mm Kamlock connectors. Wharf manifold is to be located behind the wharf to facilitate fuel hose and cargo handling. Fuel transfer hoses and pig receivers for ND and diesel.
	22 - NAVAL DISTILLATE	1 year supply (7,500,000L) split between two tanks. No spare tank.Fuel transferring infrastructure, including piping and pumping to/from the wharf manifold. Pumps located on outdoor pad. Removable drips pans included to protect against spills. Each tank has one local level indicator and one local temp indicator with one radar level transmitter. Tanks have leak detection system and are located in lined, bermed area.
	23 - DIESEL FUEL	1.5 - 2 year supply to ensure the facility is operational when a fuel supply ship comes at the start of the season. Pre-fabricated single horizontal double-walled tanks. Fuel transferring infrastructure, including piping and pumping from the wharf manifold. Removable drip pans included to protect against spills. Fuel received via vessel offloading. Diesel dispenser for fueling mobile equipment to be included. Each tank has one local level indicator and one local temp indicator with one Radar level transmitter. Tanks are located in galvanized steel secondary containment lined cell.
	24 - AVIATION FUEL	Minimum 15 drums (3,000 L) stored in POL area. Hand-pump used for fuel transfer.
	25 - MISCELLANEOUS POL PRODUCT STORAGE	40 drums of POL storage in a secure, bermed, and lined area.
	26 - OILY WASTE WATER	50 drums (10,000L) for AOPS vessels plus site generated OWW from operations & berms (stored in POL storage area).
	29 - E-HOUSE	Pre-fabricated module to house automatic transfer switch, main breaker, MCC (for supplying power to the pump motors, MOVs, PLC panel, EHT panel, lighting and fire alarm panels, WOS, general use storage building, and DND Site Office), UPS (for supplying power to PLC panel, instruments, and panel mounted HMI), and heating and ventilation.
30 - BUILDINGS		
	31 - GENERAL	
	33 - WHARF OPERATOR'S SHELTER	Skid-mounted module with viewing windows on 3 sides. Includes power (for lighting, heating and ventilation, operator work station (laptop), ESD button), portable eyewash station.
	35 - GENERAL USE STORAGE BUILDING	General use stick-built or pre-fabricated un-heated building. With electrical outlets, lights, exhaust fans and intake dampers with gas monitoring system, windows, man doors, garage doors (1), work bench, etc.
	36 - DND SITE OFFICE (CFFM requirement)	CFFM requested existing DND Site Office fire alarm system tie into the rest of facility. DND Site Office skirting and operator workstation monitoring capability. Power, control and fiber optic connection from E-house to DND Site Office

00833 Nanisivik Naval Facility Phase 3B - Work Breakdown Structure

System	Sub-System	Critical / Minimum Scope
40 - SITE UTILITIES		
	41 - GENERAL	Hand held and Wharf Wheeled Fire Extinguisher Units.
	42 - POWER GENERATION AND DISTRIBUTION	Two (2) vendor supplied self-sufficient redundant generator modules. Include day tank, heating and ventilation system, heat detectors, and fire pull stations.
	44 - FIRE PROTECTION	Passive fire protection philosophy for all equipment, including adequate spacing for fuel tanks, generators, and E-house. Fire alarms and detectors included in E-house, Generator modules, General Use Storage Building, WOS. CFFM requested existing DND Site Office fire alarm system tie into the rest of facility.
	45 - LIGHTING	Area lighting at the wharf and tank farm (attached to tanks for localized lighting). No lights on road.
60 - SITE INFRASTRUCTURE		
	61 - GENERAL	1600m^2 of secure fenced area. Adequate bermed and lined area for aviation fuel, ND POL, and OWW drums. Diesel tanks located in galvanized steel secondary containment lined cell.
	62 - SITE PREPARATION	Pipeline crossings and associated culverts. Access to tank farm, wharf road, and cargo marshalling area. Flag mast and wind sock.
	63 - FREIGHT MARSHALLING & LAYDOWN	Minimum 8,000m^2 (Existing Cargo Marshalling Area - original square footage).
	64 - HELICOPTER LANDING AREA	Large marked flat area free of obstruction.
	65 - ROADS	Onsite roads to access all areas and connecting to Arctic Bay road.
70 - ENVIRONMENTAL & INUIT PARTICIPATION		
	71 - ENVIRONMENTAL & PERMITTING	
	73 - INUIT PARTICIPATION	
80 - TEMPORARY CONSTRUCTION EQUIPMENT AND FACILITIES		
	81 - GENERAL (LABOUR PREMIUMS & PRODUCTIVITY ALLOWANCES)	
	82 - SITE MOBILIZATION (INCLUDING FREIGHT)	
	83 - PIONEER CAMP (INITIAL START-UP)	
	85 - CONSTRUCTION CAMP AND TEMPORARY CONSTRUCTION FACILITIES (INCLUDING CONSTRUCTION EQUIPMENT)	
	86 - OFFSITE STAGING AND LOGISTICS FACILITY	
	87 - SITE DEMOBILIZATION	
90 - NON-CONSTRUCTION DELIVERABLES		
	91 - GENERAL	Basis of Design, H&S, Tagging and Numbering Procedure, Operations, Occupants, Building, Commissioning, Training manuals, Emergency and Spill Response Plan, Inuit Participation Plan, Risk Register and Plan, Energy Analysis, Sustainable Development Strategy.
	92 - PLANNING / BUDGET / COSTS	
	93 - SCHEDULING	
	94 - EXECUTION	
	95 - LOGISTICS & CONSTRUCTABILITY	Construction Implementation Strategy, Statement of Construction Requirements
	96 - COMMISSIONING	
	97 - OPERATIONS & MAINTENANCE	
	98 - CLOSEOUT	

Appendix 2 Abbreviations and Acronyms

APPENDIX 2
ABBREVIATIONS AND ACRONYMS

Acronym / Abbreviation	Description
AOPS	Arctic Offshore Patrol Ship
API	American Petroleum Institute
ASU	Area Support Unit
ATV	All Terrain Vehicle
BBL	Barrel
BCEO	Building Code Enforcement Official
BFA	Barrier Free Access
BOD	Basis of Design (**Note:** DND uses this acronym separately to mean “Beneficial Occupancy Date”)
CANMARNET	Canadian Maritime Network
CCG	Canadian Coast Guard
CCME	Canadian Council of Ministers of the Environment
CCTV	Closed Circuit Television
CCVE	Closed Circuit Video Equipment
CD	Chart Datum
CDP	Central Distribution Panel
CETO	Construction Engineering Technical Order
CF	Canadian Forces
CFFM	Canadian Forces Fire Marshall
CHS	Canadian Hydrographic Service
CIR	Credit Interpretation Request
CMS	Chief of the Maritime Staff
CONOPS	Concept of Operations
CP	Cathodic Protection
CRN	Canadian Registration Number
DAOD	Defence Administrative Orders and Directives
DCC	Defence Construction Canada
DCPD	Directorate Construction Project Delivery
DCS	Distributed Control System
DEG	Diesel Electric Generator
DFO	Department of Fisheries and Oceans

Acronym / Abbreviation	Description
DIMTPS	Director Information Management Technologies, Products and Services
DMI	Director Maritime Infrastructure
DND	Department of National Defence
EPA	Effective Project Approval
ESD	Emergency Shut-Down
ESIA	Environmental and Social Impact Assessment
E-house	Electrical House
FEIS	Final Environmental Impact Statement
FP	Fixed Price (**Note:** DND uses this acronym separately to mean “Force Protection”)
FPAG	Force Protection Assessment Guide
FSM	Facility Support Manager
FSP	Functional Space Program
GFE	Government Furnished Equipment
GN	Government of Nunavut
GOC	Government of Canada
HID	High Pressure Sodium Lights
INAC	Indian and North Affairs Canada
IPP	Inuit Participation Plan
ISSSC	In-Service Site Support Contractor
JTFA	Joint Task Force Atlantic
JTFN	Joint Task Force North
LAN	Local Area Network
LEED	Leadership in Energy and Environmental Design
LOA	Length Over All
MARCOM	Maritime Command
MARLANT	Maritime Forces Atlantic
MCDV	Maritime Coastal Defence Vessels
MCP	Motor Circuit Protectors
MIC	Microbially Induced Corrosion
MMR	Minimum Military Requirements
MND	Minister of National Defence
MY	Multi-Year
NATO	North Atlantic Treaty Organisation
NBCC	National Building Code of Canada

Acronym / Abbreviation	Description
NDSI	National Defence Security Instruction
NEAC	Nunavut Eastern Arctic Shipping
NFCC	National Fire Code of Canada
NFPA	National Fire Protection Association
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claims Agreement
NMC	Nunavut Marine Council
NNF	Nanisivik Naval Facility
NNI	Nunavummi Nangminiqaqtunik Ikajuuti
NORDREG	Arctic Marine Traffic System
NPC	Nunavut Planning Commission
NRCC	National Research Council of Canada
NSSI	Nunavut Sealink and Supply Inc.
NTCL	Northern Transportation Company
NTI	Nunavut Tunngavik Incorporated
NW Tel	Northwest Telecommunication (NorthwesTel)
NWB	Nunavut Water Board
NWPA	Navigable Water Protection Act
NWT	Northwest Territories
O&M	Operations and Maintenance
OGD	Other Government Department
OWW	Oily Waste Water
PGA	Peak Ground Acceleration
PLC	Programmable Logic Controller
PM	Project Manager
POAC	Port and Ocean Engineering under Arctic Conditions
POL	Petroleum, Oil and Lubricant
PPA	Preliminary Project Approval
PWGSC	Public Works and Government Services Canada
QIA	Qikiqtani Inuit Association
RFP	Request for Proposal
ROM	Rough Order of Magnitude
SDS	Sustainable Development Strategy

Acronym / Abbreviation	Description
SOB	Sulphur Oxidizing Bacteria
SOCR	Statement of Construction Requirements
SOR-I	Statement of Operational Requirement Infrastructure
SOW	Statement of Work
SWM	Solid Waste Management
UPS	Uninterruptable Power Supply
WBS	Work Breakdown Structure
WOS	Wharf Operator's Shelter

Appendix 3 Oil Transfer Information

Canadian Coast Guard

Garde côtière canadienne

TP 12402

OIL HANDLING FACILITIES STANDARDS

1995

Canada

Additional copies of this publication may be obtained by contacting:

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Rescue and Environmental Response
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INTRODUCTION

The *Canada Shipping Act* (CSA), as amended by *Chapter 36, Statutes of Canada 1993*, outlines Canada's new marine oil spill preparedness and response regime. The private sector regime seeks to ensure that Canada is better prepared to respond to ship-source oil pollution incidents. The regime recognizes that the majority of spills occur during the loading and unloading of oil from ships and tankers. *Chapter 36* stipulates that operators of designated oil handling facilities must have an arrangement with a certified response organization and an on-site oil pollution emergency plan.

The standards for oil handling facilities were developed in consultation with interested parties representing oil handling facilities, the petroleum and shipping industries, environmental groups, provincial governments, and Canadian Coast Guard and Environment Canada.

The *Canada Shipping Act* defines standards as including "specifications and technical and operational requirements." Pursuant to section 660.6 (CSA), the Minister may issue standards for oil handling facilities. The standards provide details for operators of designated oil handling facilities in developing their oil pollution emergency plans to ensure that plans will comply with the requirements for procedures, equipment and resources as set out in the legislation (s.s. 660.2(4)) and in the regulations for Response Organizations and Oil Handling Facilities (made pursuant to s.s. 660.9(1)(b)).

The standards are intended to be used in the planning process in preparation for a response to an oil pollution incident. Each oil pollution emergency plan will be unique, taking into account the geographic features specific to the facility. Since the response to an incident will be influenced by environmental and other factors, the standards should not be used as a yardstick against which to measure the appropriateness of the response. Finally, while *Chapter 36* focuses on preparedness and response in the event of an incident, it is incumbent upon users of marine resources to prevent the spill in the first place.

OIL HANDLING FACILITIES STANDARDS

Levels of Facilities

1. For the purpose of section 2, oil handling facilities are categorized according to their maximum oil transfer rate in cubic metres per hour, in respect of each single oil product loaded or unloaded to or from a ship, as follows:

Category of Oil Handling Facility	**Maximum Oil Transfer Rate**
Level 1	150 m^3/h
Level 2	750 m^3/h
Level 3	2 000 m^3/h
Level 4	More than 2 000 m^3/h

Spill Sizes

2. The following is the minimum size of an oil pollution incident in respect of each single oil product loaded or unloaded to or from a ship, for which a response needs to be described in the oil pollution emergency plan:

Category of Oil Handling Facility	**Minimum Spill Size**
Level 1	1 m^3
Level 2	5 m^3
Level 3	15 m^3
Level 4	50 m^3

Oil Pollution Emergency Plans: Factors to Be Considered in Scenarios

3. An oil handling facility, in developing oil pollution scenarios, shall take into account the following factors:

(a) the nature of the oil product in respect of which the scenario is developed;

(b) the types of ships that are loaded or unloaded at the facility;

(c) the tides and currents that prevail at the facility;

(d) the meteorological conditions that prevail at the facility;

(e) the surrounding areas of environmental sensitivities that would likely be affected by an oil spill;

(f) the measures that will be implemented to minimize an oil pollution incident; and

(g) the time within which an effective response to an oil pollution incident can be carried out.

Priorities

4. The following priorities shall be taken into account for the purpose of establishing the order of measures to be taken during a response to an oil pollution incident:

(a) the safety of the facility's personnel;

(b) the safety of the facility;

(c) the safety of the communities living adjacent to the facility;

(d) the prevention of fire and explosion;

(e) the minimization of the oil pollution incident;

(f) the notification and reporting of the oil pollution incident;

(g) the environmental impact of the oil pollution incident; and

(h) the requirements for cleaning up the oil pollution incident.

TP 10783E

Transport Canada Transports Canada

ARCTIC WATERS OIL TRANSFER

GUIDELINES

APRIL 1997

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HIGHLIGHTS

A. Starting June, 1991, all oil transfers in Arctic waters are to be carried out in accordance with these guidelines.

B. Oil transfers exceeding 500 cubic metres are to be reported in advance to Prairie & Northern Region, Marine.

C. Oil Supervisors of Oil Transfer Operations in Arctic Waters (North of 60°00'N) are to be qualified as specified in these guidelines.

D. Checklists are to be completed and be available for viewing by a marine surveyor.

E. Only Transfer Particulars Checklists are to be forwarded to the Marine Branch.

QUICK REFERENCE

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APPLICATION OF GUIDELINES

Bulk oil transfer activities in the Arctic are carried out under a wide variety of conditions, from open water in a stiff breeze to ten tenths landfast ice with no light and very high winds.

These guidelines are intended to provide all Supervisors of Oil Transfer Operations in Arctic Waters (North of 60°00'N) and their crews with practical reminders and checklists, which will enable them to continue the good record that Arctic operators have in this endeavour.

These guidelines are intended to provide a better understanding of the problems and pitfalls of transfer activity in isolated areas and cold weather conditions.

The guidelines apply to any vessel engaged in bulk oil transfer operation in Arctic waters. However, only transfers in excess of 500 cubic metres, in a single event, should be reported according to the instructions in Section 2.1.

June 1, 1991, is the application date for all the aspects of this document, except for:

- the Hose Relief system (see Section 3.2); and
- purging procedures for transfer hoses (see Section 3.5).

These requirements came into effect on June 1, 1992.

- the recommendations to carry oil containment equipment, and for purging.

These recommendations were added for June 1, 1994.

1.0 PRINCIPLES

The aim of these guidelines is to prevent cargo/fuel oil spillage, and the resulting environmental damage, during transfer between any two vessels or between a vessel and shore terminal/storage depot, in either direction. It applies general principles already in force south of 60°N to the northern environment.

Cargo/fuel oil spillage can be prevented by:

- The safe transfer of oil cargo or fuel under all reasonable circumstances using sound, well rehearsed practices, adequate numbers of trained and alert personnel, sufficient materials, and well maintained, thoroughly tested equipment.

- Compiling and exercising contingency and emergency plans regularly and thoroughly, to familiarize all personnel involved with the essential needs and hazards of such operations.

- Prompt and correct local response in the event of a spill
  - to safeguard life and property; and
  - lessen the environmental impact of the spill.

- Prompt and accurate reporting of oil spills, to enable responsible authorities to mobilize resources and take appropriate measures, if required, to lessen the impact of such an event.

In summary, Supervisors of Oil Transfer Operations in Arctic Waters (North of 60°00'N) and their crews must be able to work safely and carefully, secure in the knowledge that reasonable precautions have been taken, and that adequate resources can be deployed if an unforeseen problem develops.

This document is intended as a guide only. The information it provides does not take precedence over present or future Canadian Laws and Regulations governing oil transfer and related activities. The crew's conduct must at all times be governed by the normal practice of seamanship and in compliance with all applicable requirements.

2.0 GENERAL CONSIDERATIONS FOR TRANSFER OPERATIONS

2.1 AUTHORITIES

All persons or organizations responsible for managing transfer operations, in excess of 500 cubic metres in a single event, should notify Prairie and Northern Region, Marine in Ottawa , via NORDREG or the nearest Coast Guard Radio Station, of plans for oil transfer operations in Arctic waters.

2.1.1 REGULATIONS

The following regulations apply to all transfers of petroleum oil products in Canadian waters, as shown in Diagram 2.1.

- Arctic Shipping Pollution Prevention Regulations (ASPPR), under the Arctic Waters Pollution Prevention Act (AWPPA):

This covers ship standards and activities in waters north of the 60th parallel, and east of the 141st meridian, for 100 nautical miles seaward, or an equidistant line between Canada and Greenland, and as defined in Section 3 of the AWPPA (Shipping Safety Control Zones).

- Arctic Waters Pollution Prevention Regulations (AWPPR), under the AWPPA. This covers the shipowner's liability provisions regarding spillage of waste.

- Oil Pollution Prevention Regulations (OPPR), under the Canada Shipping Act (CSA) -- this applies to all Canadian waters.

2.1.2 ENFORCEMENT AND PENALTIES

To ensure that regulations governing the transfer of oil and petroleum products are enforced:

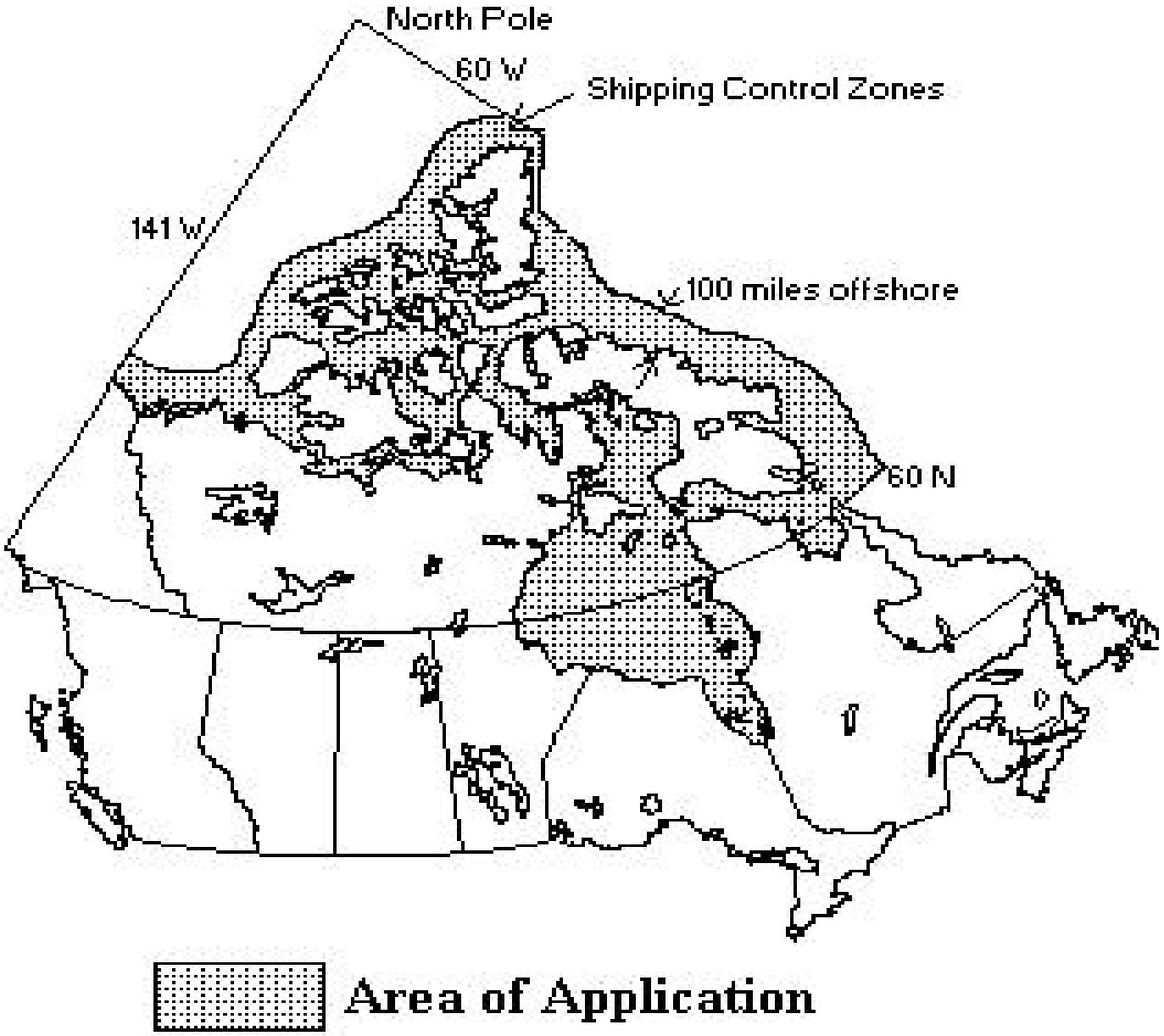
- Pollution Prevention Officers, may inspect any ship or facility in the prescribed Shipping Safety Zones, to determine compliance with the ASPPR and OPPR;

- Persons or ships found guilty of offences, described in Sections 18 and 19 of the Arctic Waters Pollution Prevention Act, are liable for fines ranging from $5,000 to $100,000 depending on the nature and duration of the offence;

- All ships must be covered for pollution spills and are liable to the extent provided by regulations.

- Persons or ships that discharge a pollutant in contravention of any regulation made pursuant to section 656 of the Canada Shipping Act are guilty of an offence or indictable offence, and are liable to fines up to $1,000,000, to imprisonment, or both. There are provisions under the same Act, concerning reporting of discharges, non-compliance with a direction of a Pollution Prevention Officer, and detention of ships;

DIAGRAM 2.1


North Pole
60 W
Shipping Control Zones
141 W
100 miles offshore
60 N
Area of Application

2.2 VESSELS AND TERMINALS

Any vessel engaged in oil transportation, transfer or storage in the Arctic should be subject to the following conditions:

- Designed, constructed, and suitably equipped for the task and conditions;
- Operated by competent qualified persons;

When transfers are made from bulk oil storage tankers:

- If Ship Safety Certificates have expired, transfers should be carefully checked and supervised; and
- Tankers should receive or discharge oil only from shore installations that are safe and that comply with Federal, Provincial, and/or Territorial regulations and standards.

2.3 LIFESAVING CONSIDERATIONS

The following equipment should be readily available for quick deployment, or depending on prevailing conditions, worn:

- Life buoys, and other lifesaving equipment; for quick deployment
  (Note: powder/rocket type line throwers should not be used).
- Approved PFDs and appropriate cold weather clothing for personnel working on barges and work boats, which may be used during ship to shore or vice-versa transfers.

2.4 SAFETY

The following safety guidelines should be observed:

- "No smoking/no naked lights or flames" warning signs should be posted.
- Announcements of an impending transfer should be made, on board the vessel(s) and at shore facilities on public address systems.
- All operations personnel should be versed and rehearsed in emergency procedures and in the use of fire fighting equipment.
- Sufficient personnel and relief crews should be available to deal with intended transfer operations and to allow for sufficient rest and food breaks, and
- Ground faults found on the main switchboard should be traced and isolated immediately to prevent arcing;
- Use an Insulating Flange, in accordance with the "International Safety Guide for Oil Tankers and Terminals";

- When loading crude oil of an unknown flashpoint, or products with known low flashpoints (jet B), routine checks for flammable gas concentrations should be made near tank vents, using approved test devices. If high readings for this product are recorded on deck, operations should be suspended, until gas accumulation clears to a safe level;

- Routine checks for gas concentration should be carried out during all ship-to-ship transfer operations;

- Radiated energy from HF radios and radar antennae can cause arcs or heat which can affect nearby ship superstructures, causing an ignition hazard. During ship-to-ship transfer, if high gas concentrations exist, these systems and equipment should be used with caution;

- SATCOM antennae and positioning systems are normally not classified as explosion proof electrical equipment, therefore gas concentrations should be carefully checked before satellite terminals are operated on vessels transferring volatile cargoes;

- During ship-to-ship transfer, main engines on both vessels should remain on "Standby", for the entire operation period:
  - engine's exhausts should be monitored for sparks,
  - spark arrestors should be checked prior to arrival,
  - boiler soot blowing should not be carried out during transfers;

- For barge transfers, and where appropriate, forward and aft emergency towing wires should be deployed over the opposite side of the vessel from the hose manifold in use and available for immediate use;

- Routine checks should be made of mooring arrangements and fenders, as well as gangways and nets, if in use;

- A minimum wind speed of 5 knots is required when transferring high volatile products (gasoline and jet B); and

- Petroleum fuel cargoes for the North should be tested to ensure adherence to Canadian General Standard Board (CGSB) or more stringent standards, especially relative to flash point and use of Static Dissipator Additive (SDA) in various jet and diesel fuels.

2.5 FIRE FIGHTING AND EMERGENCY EQUIPMENT

The following guidelines for fire fighting and the use of emergency equipment should be observed:

- Fire fighting equipment should be prepared for rapid deployment before commencing transfer;

- A fire extinguisher should be readily available, and a fire hose should be rolled out on deck at instant readiness, close to the manifold in use.

- For barge transfers, fire fighting equipment and resources on accompanying tugs and at terminals should be in a state of readiness; and

- When conditions are expected to remain below freezing during the transfer period, fire and foam lines on open decks and unheated areas should be kept dry to prevent freeze up.

2.6 CONTINGENCY PROCEDURES

Contingency procedures are vital in the event of an oil spill. Therefore:

- A "Shipboard Oil Pollution Emergency Plan" should be available in compliance with the "Oil Pollution Prevention Regulations" under the Canada Shipping Act; and

- Regular drills should be held for the operations crew, especially when new members join.

2.7 WEATHER and LOCAL ICE CONDITIONS

Weather and local ice conditions should be considered during a transfer. Therefore, during a transfer period:

- Local and regional weather forecasts and ice charts should be obtained, where available;

- Weather and ice conditions should be monitored constantly throughout the transfer period; and

- Transfer operations personnel should have suitable clothing for the prevailing conditions, and should not be exposed to severe weather conditions or other hazards for lengthy periods. Therefore, in these circumstances, the deck watch should be relieved more frequently.

2.8 LIGHTING

- Supplier and recipient facilities should be supplied with adequate lighting, particularly at the respective manifolds or fuelling stations, and over the ship side;

- Work boats involved in sealift transfers should be equipped with spotlights for hose inspections and related work; and

- Flashlights and other portable and fixed lighting apparatus, should be designed and constructed according to approved specifications for operation in flammable or explosive gas areas.

2.9 SHORESIDE CONSIDERATIONS

The area in which the transfer is to take place should be checked to ensure:

- The hose landing and handling area is free of obstructions and hazards; and

- Manifolds, bollards, and deadmen on the beach or shoreline are adequate, and clearly marked for high visibility.

2.10 COMMUNICATIONS

Good communications are essential for a smooth transfer operation, and are vital in a crisis situation. Therefore:

- The Transfer Supervisor should have the capability, for "full break-in" to the radio system or network, where possible, or a radio channel dedicated exclusively to the transfer operation;

- During transfer of volatile, low flashpoint products, hand-held radios should be used which:
  - are intrinsically safe,
  - have a VHF or UHF band, with adequate range, and
  - are on a channel or frequency agreed to by suppliers and recipients,

- Fresh batteries should be installed before the transfer commences, and replacements should be available to ensure continuous operation of the radios throughout the transfer period (Note: Battery life is shortened by cold weather conditions);

- All personnel using radios should be on the *SAME* channel or frequency (this should be verified);

- For bunkering operations, there should be adequate communications between the deck bunkering station and machinery control room;

- The following standard signals should be used in all transfer operations:
  - STANDBY TO START TRANSFER
  - START TRANSFER
  - SLOW DOWN TRANSFER
  - STAND BY TO STOP TRANSFER
  - STOP TRANSFER
  - EMERGENCY STOP OF TRANSFER.

2.11 CONTROL

To ensure accessibility:

- Emergency controls for fuel transfer pumps should be installed at the deck bunkering station; and

- Controls, running lights, and discharge pressure gauges for cargo pumps should be visible and accessible at main deck level.

NOTE The bunker transfer pump controls at the deck bunkering station apply to vessels that normally supply bunkers, i.e., this does not apply to vessels receiving bunkers, or to vessels supplying bunkers in an emergency or on a one-off basis.

3.0 PRE-TRANSFER PREPARATION AND OPERATIONS

3.1 RESPONSIBILITIES

Persons in charge of supplier and recipient vessels or facilities, should:

- Inform Prairie and Northern Region, Marine, via NORDREG, or the nearest CCG Radio Station of the intended nature and duration of transfer, 48 hours prior to the start of transfer operations, or as practicable, in sufficient time that would allow a Pollution Prevention Officer to arrive at the site and witness the transfer;

- Inform local authorities as appropriate;

- Where local traffic warrants and if the transfer location is outside "port" facilities areas, broadcast navigational warnings on VHF before starting, announcing the name(s) of vessel(s), the geographic location, the nature and expected duration, and requesting a wide berth;

- Cancel the warning when transfer operations are complete and secured;

- In all transfers, each party has the right to suspend operations at any time, if they decide it is necessary;

- Conduct a pre-transfer conference between Supervisors of Oil Transfer Operations in Arctic Waters (North of 60°00’N) of Supplier and Recipient vessels/facilities to:
  - inform each party involved of the dimensions of the other's key facilities, such as manifold/fuelling station location, maximum and minimum draught, barge/ship length, fendering arrangements, shore manifold connections, and jetty/shore characteristics such as tides, bollards, mooring and positioning aids, hidden hazards;
  - inform all participating personnel of their duties and responsibilities during the transfer, and ensure they are used versed in emergency procedures, and know the oil spill contingency plan to be followed in the event of an incident;

- Ensure engines, steering, thrusters, and manoeuvring controls, are tested and remain on stand by during transfer;

- Unless vessels are in open water, clear of land and traffic routes, with no ice present, ensure they are secured alongside or anchored, with due consideration for prevailing and expected wind, weather, ice, and tide conditions;

- Ensure that moorings (including shore moorings) are adequate to allow for draught and tidal changes during transfer;

- Suspend all operations that could cause ignition hazards around deck tank vent areas, such as:

  - welding and other hot work,
  - use of portable electrical apparatus, particularly extension cords,
  - use of portable combustion engine driven equipment,
  - other operations which could cause ignition hazards;

- Ensure all cargo manifold valves and/or fuelling connections which will not be used in the current transfer are isolated and blanked;

- Ensure sea valves in cargo pumprooms are closed and sealed;

- Ensure valves which will be used for the transfer, are free of ice or other obstructions, and are easy to operate through their full range;

- Ensure all deck scuppers are plugged to contain any oil spilled, and that freeing ports and other open areas where spillage could go overboard are closed;

- Ensure absorbent material is readily available at the flexible hose connections on deck and other predictable minor spill locations;

- Ensure containers, or drip trays of suitable size are placed under tank vents, manifolds, fuelling connections, or other locations where adequate permanent containment arrangements are not fitted;

- Ensure accommodation deck doors, deadlights or shutters, ports, and vents are closed;

- Ensure flame arrestors or gauze screens and pressure/vacuum relief valves (PVR) are checked;

- Ensure no helicopter landings or takeoffs occur during transfer operations;

- Ensure vessel air conditioning systems are on recirculation mode;

- Ensure vessels hoist the appropriate signals by day and night; and

- Ensure that all valves and pipelines required for the current transfer are open, and that all other valves and pipelines in connected systems are closed and secured. Ensure this is double checked by the assigned crew members and the Transfer Supervisor/Cargo Officer.

3.2 HOSE PREPARATION AND HANDLING

When preparing and passing the blanked or capped hose between the Supplier and Recipient, the following procedures should be observed:

- Check for a valid hose certificate, confirming that the hose has been satisfactorily inspected during the past 12 months, according to the Oil Pollution Prevention Regulations;

- Check individual hose test markings or tags;

- Define who will supply the transfer hose and establish hose configuration -- diameter, total hose length, coupling type and number, operating pressure of hose and couplings, type of terminal flange (size/class, etc.);

- Define hose purging method between products, and after final transfer;

- Examine "O" rings and joints in couplings and replace any damaged seals or gaskets;

- Inspect hose-to-coupling clamps visually to ensure good condition and security and repair or replace any damaged clamps, where possible, or use spare hose lengths;

- Check that an insulating flange or coupling is in place;

- Secure hose coupling clips with safety wire;

- Ensure lifting and restraining arrangements are suitable for the type and dimensions of hose used, and that the apparatus will prevent hose damage due to ship movement in swells or draught changes;

- Ensure the hose is suitably supported throughout the hand-over, and during the transfer, to avoid damage and prevent kinks;

- When transferring sea hose ashore, ensure the hose is free from chafing, or pinching between ice floes or rocks;

- Use hose strain relief system with long floating hose transfers to prevent strain on the hose string from winds, tides, and ice;

- Examine the completely installed hose string carefully and repair or replace any damaged hoses, flanges or joints, before starting the transfer;

- Minimize the number of couplings by using longer hose lengths; and

- In ship to shore transfers use a suitable boat to send the hose ashore.

3.3 TRANSFER

The following procedures should be followed before and during a transfer operation:

- Complete the pre-transfer check list;
- Have a responsible person, with an operational radio set on the correct channel/frequency, near the cargo/transfer pump start/stop control throughout the transfer;
- Start pumping at a previously agreed slow rate, while rechecking hose string for leaks;
- Ensure the product is going to the correct recipient tank;
- Maintain the normal pumping rate, as agreed with the other party, until topping off is required;
- Examine the hose string regularly during transfer and watch for signs of undue strain, bulging, and other evidence of real or potential leaks;
- For floating hose, patrol the string, check the water in the area for leakage signs, and look for coupling problems, or snags on ice floes;
- Check both Supplier and Recipient tanks regularly for both content level and product, and investigate any anomalies, suspending the transfer if necessary;
- Keep a constant check on the pumping pressure and immediately investigate any pressure variations of an unexpected nature;
- Make regular visual checks of the water immediately surrounding the vessel(s) and transfer area;
- Reduce transfer rate, when Recipient tanks are nearly full, for topping off; and
- Use an automatic stop device which will shut down the pump when the flow rate or back pressure exceeds a pre-set level.

3.4 EMERGENCY STOP

If any of the following conditions occur, the transfer should be stopped immediately:

- LOST COMMUNICATIONS;
- LOSS OF ABILITY TO MONITOR HOSE TO SHORE;
- SIGN OF SPILLAGE, OR DAMAGE TO HOSES AND COUPLINGS;
- ANY DETECTION OF ACCUMULATED GASES;
- MAJOR INCREASE IN WIND AND/OR SWELLS;
- WHEN AN ELECTRICAL STORM IS PRESENT OR PREDICTED;
- SEVER DETERIORATION IN ICE OR VISIBILITY CONDITIONS;
- HELICOPTER LANDINGS OR TAKE OFFS; and
- ANY OTHER SITUTATION DEEMED DANGEROUS BY THE TRANSFER SUPERVISOR.

In the event of a spill, the Spill Contingency Plan should be initiated immediately by:

- Informing Prairie and Northern Region, Marine, via NORDREG, of the situation; and

- Informing NWT 24 hour Spill Line at 1-403-920-8130 and providing them with the following information (see Spill Line Form for further details):

  - location and time of spill,
  - type and approximate quantity of product spilled,
  - precautions being taken at time of notice,
  - current state of tide and local weather,
  - extent of local and shipboard containment and recovery resources,
  - personnel numbers and skills available on site as well,
  - request for extra resources, and advice, if needed, and
  - complete the Spill Line Form.

3.5 AFTER TRANSFER

When the transfer has been completed, the following procedures should be followed:

- Purge the hose by previously agreed method (see II - Recommendation for Purging), and shut all manifold and tank valves; when purging ensure that no air will be introduced to the tanks at the shore facility;

- Sound all tanks, (after waiting for settling, if necessary), and confirm with both parties that quantities of fuel/cargo have been properly transferred;

- Stow hoses securely for sea passage;

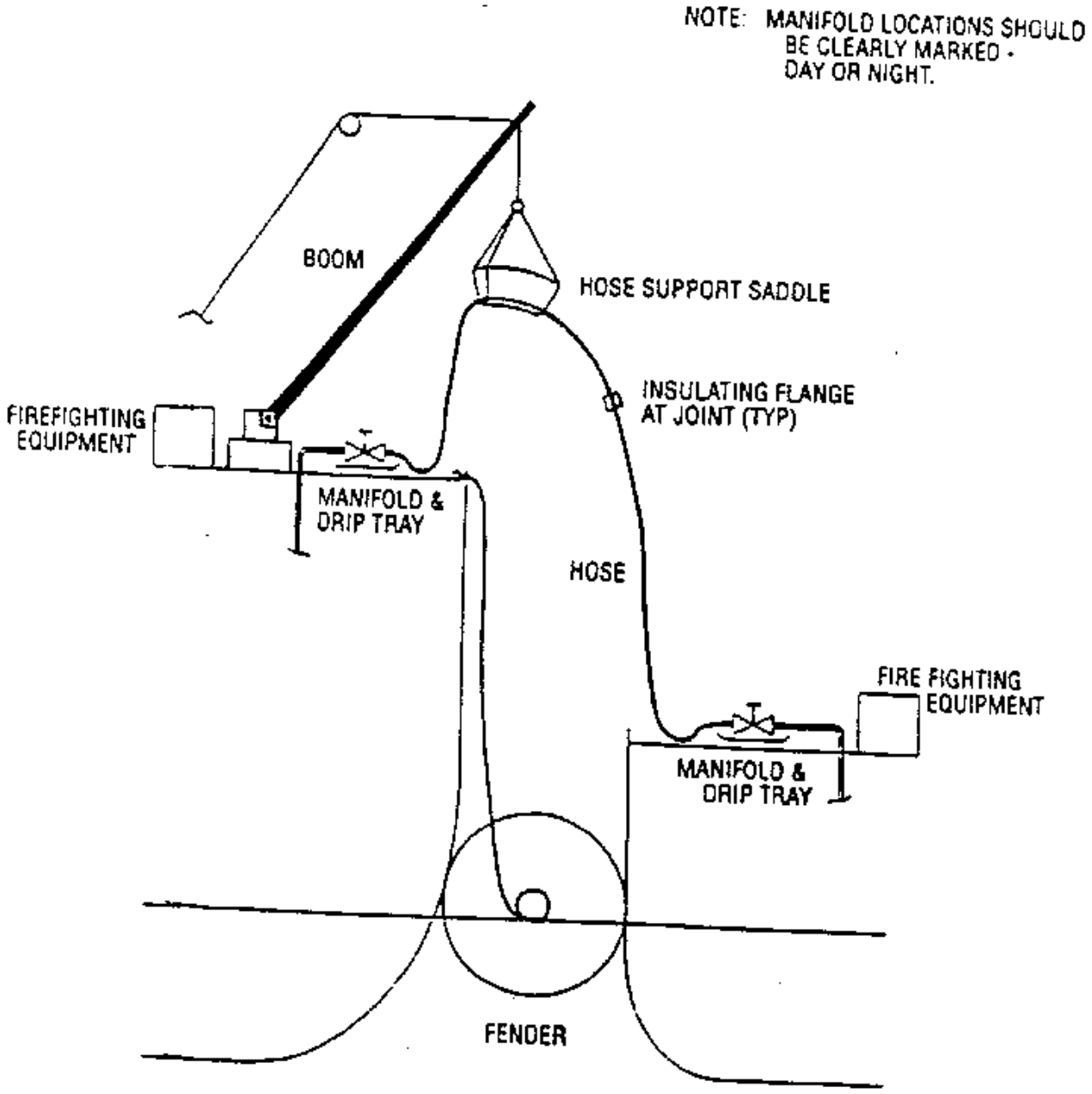
- Complete transfer checklists;

- Ensure the ship's and facility's Oil Books and Checklists are signed, kept up to date, and retained for examination by a Pollution Prevention Officer or other authorized official, (by prior arrangement with Prairie and Northern Region, Marine, organizations may use their existing checklists for recording transfer preparation conditions, provided all major aspects are covered in those checklists);

- Forward the transfer particulars checklist or a post-season summary of operations and quantities, for statistical records and prevention guidelines improvement purposes, to Prairie and Northern Region, Marine by the calendar year-end.

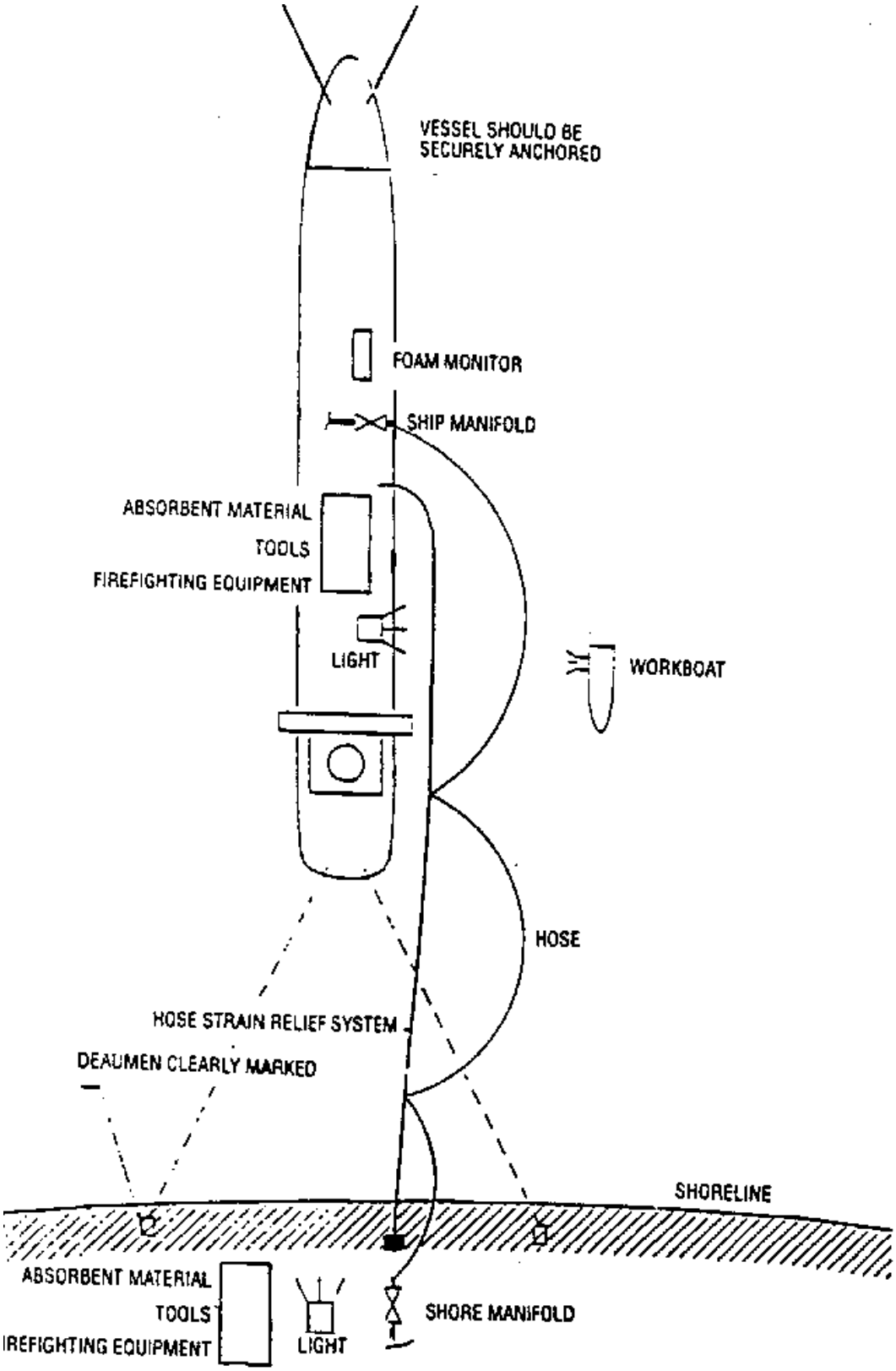
Address: Transport Canada
Prairie and Northern Region, Marine (AMNS - OTT)
Place de Ville, Tower C, 14th Floor
330 Sparks Street
Ottawa, Ontario
Canada, K1A 0N5
Tel: (613) 991-6004
Fax: (613) 991-4818

FIGURE 3.1



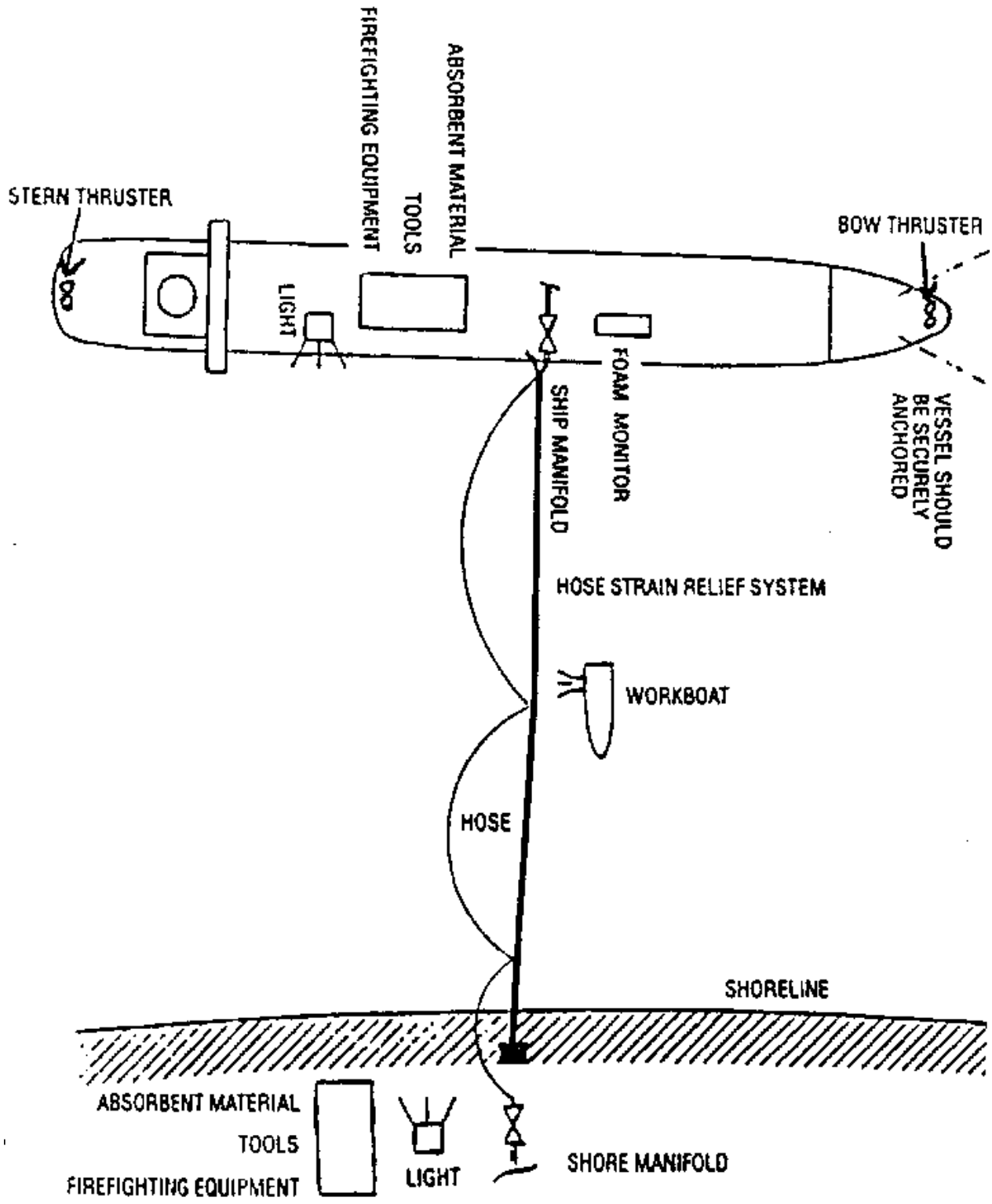
Typical Ship-to-ship Transfer Arrangement

FIGURE 3.2



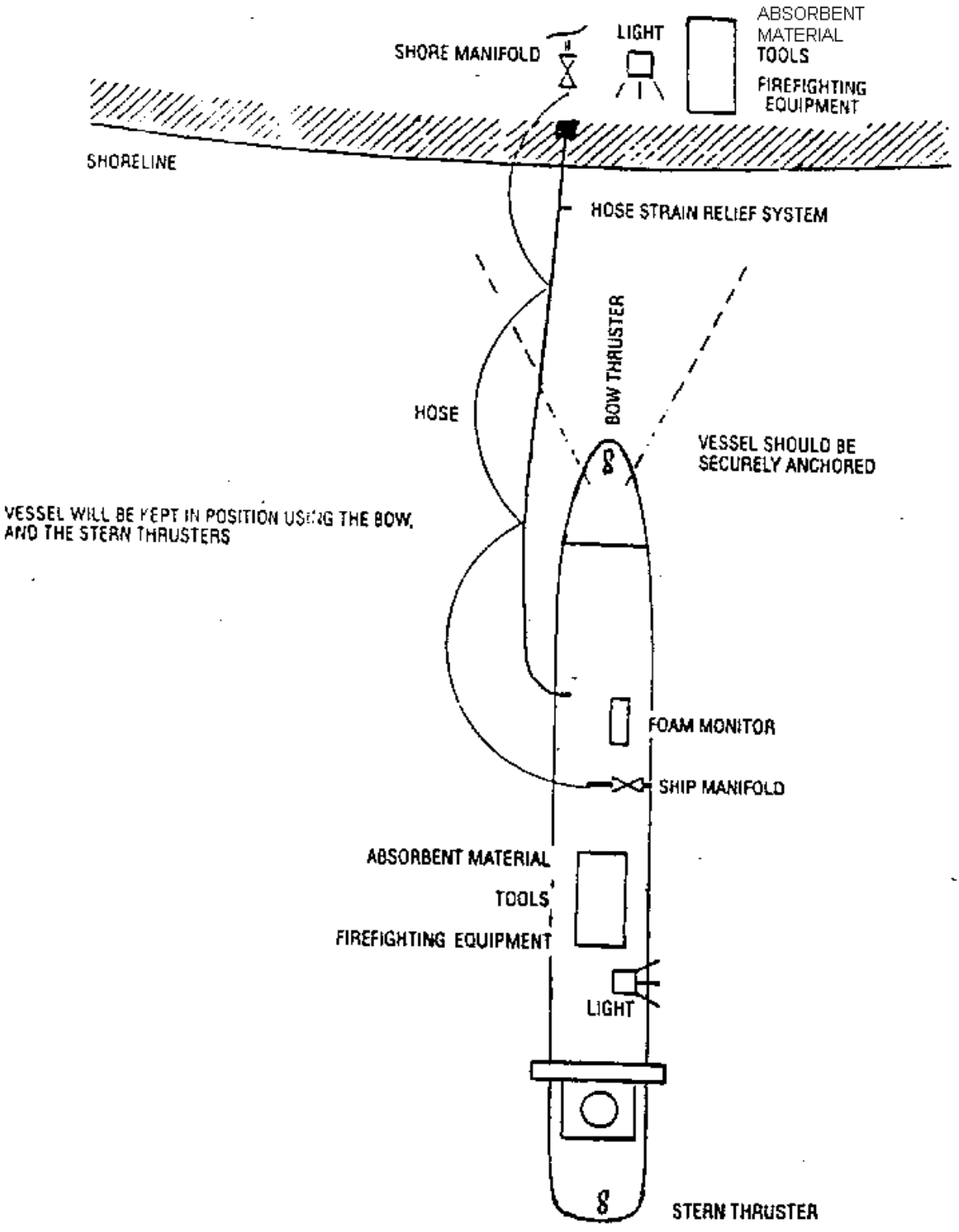
Typical Ship-to-shore Transfer Arrangement

FIGURE 3.3



Alternative Ship-to-shore Transfer Arrangement

FIGURE 3.4



Alternative Ship-to-shore Transfer Arrangement

4.0 REQUIREMENTS FOR OIL TRANSFER SUPERVISOR

(1) Every transfer operation carried in Arctic Waters, must comply with the following:

(a) a qualified person must supervise the transfer operation; and

(b) all reasonable precautions will be taken to avoid the discharge of waste into the water during the transfer operations.

(2) Any person supervising Ship-to-Shore oil transfers in Arctic waters shall be at least eighteen years of age and shall:

(a) be qualified as Supervisor as prescribed in the "Oil Pollution Prevention Regulations-Chapter 40 and 41" under the Canada Shipping Act; and can produce a valid written evidence to that extent; and

(b) have served in oil transfer operations, under the supervision of a certified supervisor, for at least two (2) Arctic seasons, during which period that person has been engaged in at least six (6) Ship-to-Shore transfer operations, and can provide a testimonial to that extent to Prairie and Northern Region, Marine.

(3) The written evidence required by subsection 4.0(2)(a) shall be valid only until the date five years after the date that the qualifications specified therein were satisfied.

RECOMMENDATIONS

I - RECOMMENDATION FOR SPILL RESPONSE EQUIPMENT

- The basic premise under Canadian Law and Regulations is that the polluter is responsible for clean up;

- Government/industry guidelines, including the "Guidelines for the Operation of Tankers & Barges in Canadian Arctic Waters" require ships to deal with on-deck spills;

- Taking into consideration the remoteness of northern locations where oil transfer operations occur, it is prudent to have available spill response equipment for minor spills in the water;

- The equipment may be provided by the ship, other ships in the vicinity, or the shore facility;

- Trained crew that participate in exercises with the equipment provided are an essential part of the contingency plan; and

- The list of equipment provided here is a ***recommendation*** only and is for the guidance of ship operators intending to equip their ships with clean-up equipment.

SPILL RESPONSE EQUIPMENT

CONTAINMENT EQUIPMENT

Sufficient containment equipment to completely encircle the vessel or the largest barge in a tow, in case of tug/barge operation, complete with accessories to deploy and maintain in a workable condition.

SKIMMING EQUIPMENT

Sufficient skimming capabilities to recover, within 48 hours, a volume equivalent to the largest tank of the vessel, or the largest barge in a tow, in case of tug/barge operation.

SORBENT MATERIALS

Sufficient sorbent materials to maintain operations for a period equivalent to the lead time expected for replacement stock to arrive on site or 48 hours, whichever is greater.

MISCELLANEOUS SHIP OR BARGE BASED EQUIPMENT

All other equipment which could be useful and would be available to a response crew in the initial 48 hours following a pollution incident.

II - RECOMMENDATION FOR PURGING

- The "pig launcher" should include a "Y" piece and isolating valve to avoid the need to disconnect the hose prior to purging. The "Y" piece should have a stopper to prevent the pig from being pushed back to the manifold valve, and air pushed in the line.

- The "pig launcher" and the "pig catcher" should be fitted with a viewing port; and

- A soft foam pig 60.96 cm (24") in length and 10.16cm (4") in diameter should be used, as this type of pig has proved superior to other types.

GLOSSARY of TERMS

ASPPR	*Arctic Shipping Pollution Prevention Regulations*, under the AWPPA.
AWPPA	*Arctic Waters Pollution Prevention Act*
CCG	Canadian Coast Guard.
CONTINGENCY PLAN	Plan of action to be taken in the event of an unforeseen or unusual circumstance; e.g., loss of communication, or hose/coupling damage.
EMERGENCY PLAN	Plan of action to be taken in the event of a sudden state of danger; e.g., a shipboard or shore terminal fire, or the sudden breakage of moorings.
INAC	Indian and Northern Affairs Canada.
NWT	Northwest Territories.
OPPR	*Oil Pollution Prevention Regulations*, under the Canada Shipping Act.
PFD	Personal Floatation Device.
RECIPIENT	Vessel or shore terminal ***TO*** which oil fuel/cargo is being transferred.
SUPPLIER	Vessel or shore terminal ***FROM*** which oil fuel/cargo is being transferred.
TRANSFER SUPERVISOR	Qualified ship's officer, barge operator or terminal supervisor, experienced in oil fuel/cargo transfer in the Arctic, between vessels and/or vessels and shore.

ARCTIC WATERS OIL TRANSFER

TRANSFER PARTICULARS

VESSEL / STATION INFORMATION			Location:	
	Supplier	Recipient	Start Date	
Vessel / Station Name			Start Time	
Officer in Charge			Finish Date	
Title			Finish Time	

OPERATIONS	
Transfer Type:	Connection Type (eg 2/4 bands):
Total Length of Hose (m):	Number of Hose Sections:
Diameter (m):	Test Pressure (kPa):
Purge Method: Nitrogen / Air	Pig Used: Yes / No
Boom deployed before transfer: Yes / No	If yes, type:
Work Boat used: Yes / No	
Hose Strain Relief System used: Yes / No	

PRODUCT INFORMATION				WEATHER CONDITIONS
Type	Quantity	Start Time	Finish time	Ice:
				Wind Force (knots):
				Wind Direction:
				Sea State:
				Visibility:
				Light Conditions:

COMMUNICATIONS	
Primary Method:	(VHF/UHF CHAN/FREQ)
Backup Method:	(PHONE, RADIO, ETC)
Language Used:	

Note: Return a completed copy of this form (or a post season summary) to Prairie and Northern Region, Marine (AMNS-OTT) in Ottawa.

ARCTIC WATERS OIL TRANSFER — GENERAL CHECKLIST FOR ALL TRANSFERS

GENERAL PROCEEDURE	CHECK	SUPPLIER		RECIPIENT		COMMENTS
	YES	INITIAL	DATE	INITIAL	DATE	
1. Pre-transfer P.A. Announcement made?						
2. All personnel involved are informed & adequately trained? A designated person in charge on duty at all times during the transfer operation?						
3. Language agreed to?						
4. All communications including Backup System tested?						
5. Is fire fighting equipment tested, available & are fire screens in place?						
6. Are all regulations for transfer understood and observed and "NO SMOKING, NAKED LIGHTS or FLAMES" signs posted?						
7. Are flashlights "intrinsically safe" and approved?						
8. Are window type A.C. units switched off?						
9. Are exterior doors and ports leading to main deck closed?						
10. Is equipment, tools & material required for transfer available at hand?						
11. Is containment equipment and absorbent material available?						
12. Has Transfer Emergency Shutdown been tested?						
13. Hoses to be used have been checked for:						
a) correct diameter & length to reach other station,						
b) chafing, cracks or other deformation,						
c) damaged fittings,						
d) blanking of hoses,						
e) continuity.						
14. All repair work at either station stopped. (if dangerous for transfer)						
15. Inert gas system is fully operational (if fitted).						

GENERAL PROCEEDURE	CHECK	SUPPLIER		RECIPIENT		COMMENTS
	YES	INITIAL	DATE	INITIAL	DATE	
16. Main transmitting aerials and radar scanners are used with due care.						

GENERAL PROCEEDURE	CHECK	SUPPLIER		RECIPIENT		COMMENTS
	YES	INITIAL	DATE	INITIAL	DATE	
17. All craft alongside are authorised and following hazard warnings, etc.						
18. Is hose test certificate or records available for inspection?						
19. Have weather and ice reports been determined?						
20. Are gas concentration accumulations in still air conditions monitored?						
21. Are all scuppers plugs in place?						
22. Are main decks free of standing water?						
23. Were manifolds drained before removing blanks?						
24. Are pressure gauges ready and in place?						
25. All sea valves on cargo systems closed?						
26. Are drip cans and trays in place, and empty?						
27. Is lighting adequate for all transfer requirements?						
28. Is mooring watch being monitored?						
29. Are spill reporting procedures understood?						
30. Are all tank vents free of blockage?						
31. Have Pressure/Vacuum Relief (PVR) valves been checked?						
32. Has a post-transfer PA announcement been made?						
33. Are International signals being displayed? (if required)						
34. Has a written procedure and the sequence of the transfer been agreed upon?						
35. Is there a clear understanding of the watch and shift arrangement?						
36. Will there be sufficient personnel available at all times to monitor the transfer operation, tend cargo hose and mooring lines and take appropriate action in an emergency?						

ARCTIC WATERS OIL TRANSFER — CHECKLIST FOR SHIP TO SHIP TRANSFERS

SHIP to SHIP - PROCEEDURE	CHECK	SUPPLIER		RECIPIENT		COMMENTS
	YES	INITIAL	DATE	INITIAL	DATE	
1. Has the General Checklist for All Transfers been completed?						
2. Are the primary and secondary fenders in place?						
3. (a) Have the tanks, pipeline and valves been set to accept transfer? (b) Are the first tank(s) and valves open?						
4. Are all other tank valves closed and set for normal operation?						
5. Are valves not being used, shut and blanked on the manifold?						
6. Are the transfer hoses adequately supported & properly connected?						
7. Are all connections checked for leaks?						
8. Are regular checks of the water around vessels for evidence of leakage, being made?						
9. Are regular checks on the hose pressure being made to ensure that the recommended pressure is not exceeded?						
10. Are tank monitoring / sounding / ullage measurement procedures in place?						
11. Will the transfer be shut down if the vessel movement becomes excessive?						
12. Are vessel's engines on Standby?						

ARCTIC WATERS OIL TRANSFER CHECKLIST FOR SHIP TO SHORE TRANSFERS

SHIP to SHORE - PROCEEDURE	CHECK	SUPPLIER		RECIPIENT		COMMENTS
	YES	INITIAL	DATE	INITIAL	DATE	
1. Has the General Checklist for All Transfers complete?						
2. Are all vehicles outside the agreed safe distance?						
3. Are the emergency towing wires in place?						
4. Is the vessel ready to move under its own power immediately?						
5. Has a hose drainage plan been agreed upon?						
6. Has the hose string been checked to working pressure?						
7. Is a work boat deployed to check the hose frequently for leaks during transfer?						
8. Are all transfer associated valves and tanks closed after transfer?						
9. Have hoses been purged prior to their return to the vessel?						
10. Are hoses and other transfer equipment properly stowed?						

ARCTIC WATERS OIL TRANSFER — CHECKLIST FOR BARGE TRANSFERS

BARGE - PROCEEDURE	CHECK	SUPPLIER		RECIPIENT		COMMENTS
	YES	INITIAL	DATE	INITIAL	DATE	
1. Has the General Checklist for All Transfers been completed?						
2. Is the discharge pump as close as possible to suction pipe of the discharge tank?						
3. Check hard line hose between pump and tank (if fitted)?						
4. Check couplings on discharge between pump and recipient?						
5. Do not exceed the following: a) maximum list (P & S) b) maximum trim (FWD & AFT)						
6. Are barge tank diagrams and pipe schematics available?						
7. Are fenders between the barge and other vessel?						
8. Is barge equipment bonded to barge structure?						
9. Are fire screens installed in ullage openings?						
10. Are all valves closed and hoses stowed after completion of transfer?						

Appendix 4 Material Safety Data Sheets (MSDS) for Commonly Stored Fluids

(Construction General Contractor to Provide)

Appendix 5 Spill Reporting Matrix

(Construction General Contractor to Provide)

Appendix 6 Induction Process for New Emergency Response Team Members

(Construction General Contractor to Provide)

Appendix 7 Emergency Facilities Checklist

(Construction General Contractor to Provide)

Appendix 8 Observation of Vital Signs

(Construction General Contractor to Provide)

Appendix 9 Bomb Threat Checklist

(Construction General Contractor to Provide)

Appendix 10 Medical Information Form

(Construction General Contractor to Provide)

Appendix 11 Incident Report Form

(Construction General Contractor to Provide)

Appendix 12 Wildlife Encounter Log

(Construction General Contractor to Provide)